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Eastland Disaster a Severe Lesson

Revision of All Our Maritime Laws by Non-Partisan Experts and Complete Overhauling of Government Departments Demanded—Stability Tests to be Required

WHEN the excursion steamer EASTLAND capsized at her dock on Saturday morning, July 24, carrying approximately a thousand people to their doom, one more link—we hope it is the last—was forged in the chain of evidence proving the incapacity of the federal government to protect the maritime interests of this country. In the destruction of EASTLAND, with its accompaniment of human misery, the steamship interests of the United States have been dealt a blow from which it will take many months to recover. We do not refer to direct losses in passenger revenue, which undoubtedly will be inconsequential, but to the disrupting effect of the aftermath of hysteria that inevitably follows an affair of this kind. In such cases, the innocent always suffer with the guilty and the owners and operators of legitimate, safely and conservatively managed steamship lines will be punished along with the few, reckless black sheep from whom both the public and the steamship interests have a right to expect protection by the government.

While the EASTLAND disaster was very likely due to the incompetent manipulation of water ballast in a boat known to be deficient in metacentric height and therefore tender, fundamentally the responsibility rests on the government.

Shackled by Absurd Laws.

We do not wish to be misunderstood in this assertion. *The Marine Review* does not share the popular conception that all of the officials of the steamboat inspection service are criminally negligent, reckless and incompetent. We believe these men, in the main, perform their duties conscientiously and effectively, as far as the law permits them to go.

The difficulty is much deeper seated. Absurdities, contradictions and hiatuses are no more pronounced in the law governing the steamboat inspection service

than in our other maritime and navigation acts and recent legislation, including the seamen's act, has only added to the confusion.

In brief, the basic trouble is that the great mass of our people, dwelling in the interior of the country, know nothing and care less about our maritime affairs. Some of the newspapers in the central west that are now clamoring the loudest for revenge, whose every effort is to "get" somebody, have been foremost in the fight against a sane, intelligent merchant marine policy for the United States. As a result, marine legislation has become a football of politics and the prey of such self-abnegating statesmen as Senator La Follette.

Revenge Saves No Lives

It is not so important to find who is to blame for the EASTLAND catastrophe and to mete out vengeance, as to find out *why* the accident occurred and to take steps to make its recurrence impossible. Although the suggestion is trite, what we need to do is to take the whole merchant marine subject out of politics and place it in the hands of a non-partisan body of qualified experts. If the work were turned over to men of real standing and experience in maritime affairs, our present laws could be codified and amended so that they would foster and protect our merchant marine and reduce disasters to a minimum.

The navy department recently has seen the light and from now on is to have the benefit of the advice and direction of a board of civilian experts. The department of commerce would do well to follow this example in dealing with our merchant marine. Such a board should include the most eminent men in maritime affairs in the country; men of less ability and experience would be unacceptable and unless the appointments were lifted absolutely clear of political considerations, the plan would be a failure.

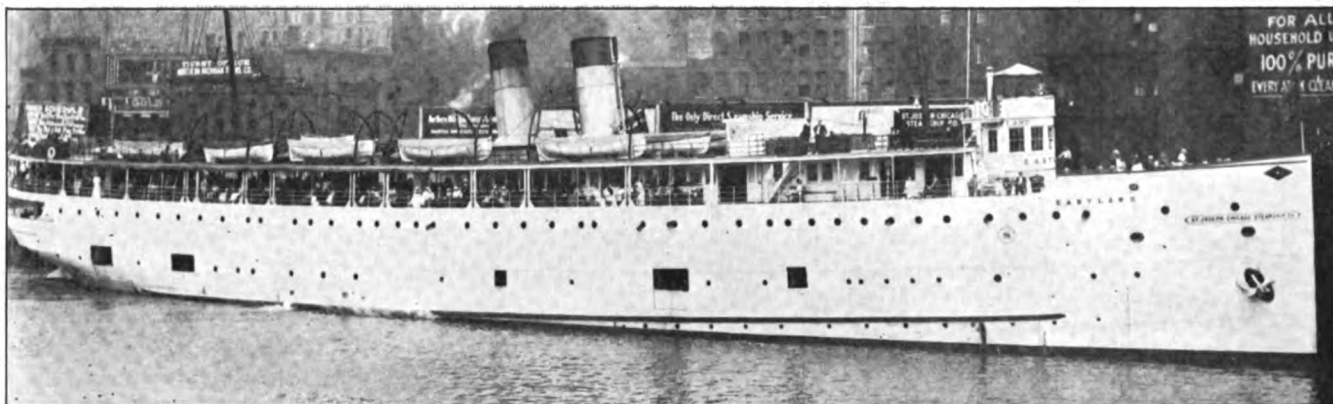


Fig. 1—Eastland in Chicago Harbor a Few Weeks Before the Accident

Eastland Brings Tragedy to Lakes

Chicago the Scene of Worst Marine Disaster Ever Occurring in American Waters—Testimony Regarding Water Ballast Significant—Politics Plays Prominent Role in Investigations

By H. Cole Estep

FROM the day they are launched some ships seem to be pursued by an evil genius and such was the fate of EASTLAND, who concluded her checkered and at times stormy career of 12 years on the Great Lakes by capsizing at her dock at Chicago on Saturday morning, July 24, with 2,572 persons aboard nearly 1,000 of whom were drowned. The story of the catastrophe has been so widely published that it is useless to repeat it in any detail at this time. What we are now concerned with is the aftermath. "Why did EASTLAND capsize, and what can be done to prevent a repetition of such disasters in

the future?" These are the two questions in which the readers of *The Marine Review* are now most particularly interested.

EASTLAND was one of a fleet of five steamers which had been chartered by the Indiana Transportation Co., W. J. Greenebaum, general manager, to carry the employees of the Western Electric Co. on their annual picnic from Chicago to Michigan City, Ind., where there was to be a big parade and great festivities. About 7,000 tickets were sold although subsequent investigation has amply substantiated the contention that not more than the 2,500 passengers lawfully allowed were per-

mitted to board EASTLAND. She was scheduled to depart at 7:40 a. m., but never left her dock. She capsized shortly after 7:30 and subsequent testimony indicated that she was slowly listing for a period of about 17 minutes before the final plunge.

Up to the time this issue of *The Marine Review* went to press the cause of the disaster had not been definitely determined, although four formal and several informal investigations have been made by various legal and governmental authorities. During her entire career, however, the boat was known to be tender, lacking stability and metacentric

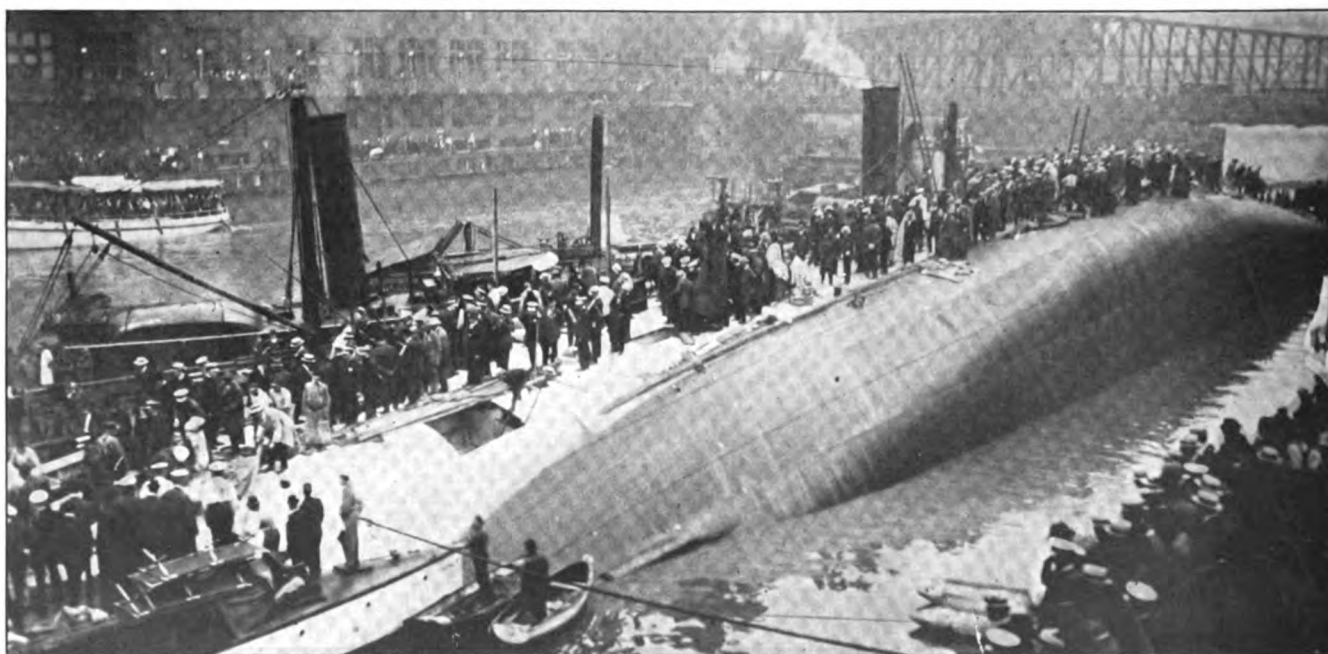


FIG. 2—THE WRECK IMMEDIATELY AFTER EASTLAND CAPSIZED

height when not properly ballasted. She was provided with water ballast and the preponderance of evidence at the time this article is written is that the ballast tanks were empty or practically so when the vessel capsized. This undoubtedly accounts for her fatal instability. Probably also the port holes under the main deck leading into the crew's quarters were open, thus admitting large quantities of free water as soon as the boat had listed a few degrees. These port holes and their proximity to the water line are clearly shown in Fig. 1. It is not believed by competent authorities that the number of passengers on board EASTLAND had much to do with the accident. Of course if a less number had been permitted by the federal officials, fewer would have been drowned, but the weight of 2,572 per-

Capt. Henry Pedersen, Benton Harbor Mich.; Delbert Fisher, St. Joseph, Mich., was first mate; Peter Fisher, Grand Rapids, Mich., second mate; J. M. Erickson, St. Joseph, Mich., chief engineer; C. F. Silvernail, Manistee, Mich., first assistant engineer; and F. T. Snow, Ludington, Mich., second assistant engineer. One of the most important versions of the affair is that of Capt. Pedersen. In an interview with a Chicago newspaper representative he is reported as follows:

"First she listed to starboard and then straightened up all right, and I was going to send out the word to let go the line. She listed over to port and I hesitated. I had already given the second mate orders to stand by and let go the stern lines.

"I gave the warning to stand by because she was listing and she kept

"But you were not afraid of her?"

"No, sir."

"Were you surprised at her listing?"

"Yes and no."

"What caused her to keep on listing?"

"I don't know."

"Have you any theory as to why she kept on listing?"

"Probably too heavy a weight on the listing side."

EASTLAND was completed early in July, 1903, at the yard of the Jenks Ship Building Co., Port Huron Mich. The following paragraphs are quoted from an article describing the vessel published in *The Marine Review*, July 16, 1903.

"Until the Jenks company began work on this vessel, the plant at Port Huron had been engaged almost entirely on large freighters of the ore and grain-carrying kind. In EASTLAND the company presents a high-class

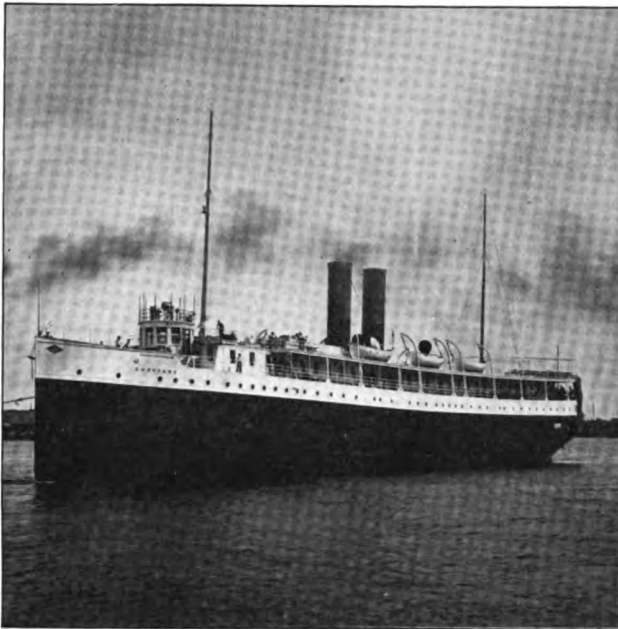


FIG. 3—EASTLAND IN 1903 JUST AFTER SHE WAS BUILT



FIG. 4—BOW OF THE WRECK WHILE RESCUE WORK WAS IN PROGRESS

The photograph from which the engraving for Fig. 3 was made, was taken in 1903 immediately after Eastland was constructed and therefore forms an interesting comparison with Fig. 1. Fig. 3 was published originally in *The Marine Review*, July 16, 1903.

sons, about 193 net tons, would not be sufficient to seriously careen a vessel of the displacement of EASTLAND, provided it had the requisite inherent stability.

EASTLAND is owned by the St. Joseph-Chicago Steamship Co., of which Geo. T. Arnold, Mackinac, Mich., is president; Wm. H. Hull, St. Joseph, Mich., vice president and general manager; Walter G. Steele, Chicago, secretary; Ray Davis, St. Joseph, Mich., assistant general manager; and Martin Flatow, Chicago, general agent. In addition, Mrs. E. A. Graham, Mrs. Mary Graham and C. E. Blake, St. Joseph Mich. are heavy stockholders of the steamship company. The steamer was in command of

on listing. The harbor master was on the dock. He shouted 'Are you ready, captain?' He wanted to throw the lines out. I didn't start, although I thought she was going to straighten up.

"Were the tow lines on the tug at the time?"

"Yes."

"The tow lines were on the tug at the time she listed?"

"Yes, sir, she had lines on both ends—two lines forward and two lines aft."

"Were the lines taut?"

"No."

"You had given the signal to go?"

"No, sir."

"Was the tug holding the lines taut after the EASTLAND listed?"

"No."

"Has she ever listed before?"

"Yes, pretty bad before."

steamer that is expected to be among the fastest on the lakes. The vessel is attractive in appearance and engineers who have seen her say she will certainly be fast. She will be engaged mainly in the fruit trade between South Haven and Chicago, but her appointments for passengers are of the highest order and she will undoubtedly attract quite a large passenger patronage.

"Her dimensions are: Length over all, 275 feet; length of keel, 265 feet; beam, 38 feet; molded depth, 22 feet 8 inches. Her depth of hold is 10 feet 9 inches. She is fitted with a double bottom throughout. There are five watertight bulkheads. The hull construction in all respects is unusually

strong. The vessel is equipped with two triple-expansion engines, having cylinders of 21, 34 and 56 inches diameter with a stroke of 30 inches, and supplied with steam from four Scotch boilers, 13 feet 6 inches in diameter and 12 feet 6 inches long, allowed a working pressure of 200 pounds. The horsepower is about 3,500 and the vessel is intended to maintain a scheduled speed of 20 miles per hour.

"EASTLAND has three steel decks. Her main and upper saloons are fitted throughout in mahogany in the most approved manner. Her state-rooms, of which there are 100, reach flush out to the deck so that there is no promenade about them as in most

with every convenience, including electric lights throughout, a powerful searchlight, running water in every stateroom, etc.

"The officers of EASTLAND are Capt. J. C. Perue, First Officer Charles R. Richardson and Chief Engineer Geo. F. Randall."

Two illustrations of EASTLAND are presented herewith. One, Fig. 3, shows her as she looked just after she left the builder's hands. This illustration was first published in *The Marine Review*, July 16, 1903. Fig. 1 shows the steamer in Chicago harbor a few weeks before the accident. A comparison of these two views indicates that the structural altera-

sels and facts which have been brought out since the disaster tend to indicate that stability calculations were not made by competent engineers at the time the vessel was built. EASTLAND had a gross tonnage of 1,961, the net being 1,218.

She was owned originally by the Michigan Steamship Co., South Haven, Mich. This concern found her unprofitable and in 1907 she was sold to the Eastland Steamship Co., of Cleveland, going into the excursion business between Cleveland and Cedar Point. The Eastland Steamship Co. was composed of Alexander Winton, Charles Shank, Walter C. Baker, John Krause and others. A \$275,000



FIG. 5—HENRY PEDERSEN, CAPTAIN OF EASTLAND, IS SEEN AT THE RIGHT, EXPLAINING THE ACCIDENT TO ASSISTANT STATE'S ATTORNEY M. F. SULLIVAN, WHO IS SEATED AT THE EXTREME LEFT

passenger vessels. However, there is a house on top of the deck with a promenade about it. The dining room is forward of the main saloon and is finished in quarter-sawed oak in contrast with mahogany. The dining room reaches from side to side of the steamer and is, of course, abundantly lighted by that arrangement. It is probably the most attractive part of the ship. The smoking room is aft of the upper house, approached from the gallery; and the ladies cabin is on the saloon deck. The part of the vessel devoted to passengers is entirely free of annoyance on account of freight. The steamer is equipped

with every convenience, including electric lights throughout, a powerful searchlight, running water in every stateroom, etc. The later picture shows that the deck house, which originally extended almost to the stern, was cut down at a point immediately abaft of the rear smokestack. There is no indication of any deck having been cut off, as has been currently reported. Originally the smokestacks were somewhat higher than they were at the time of the accident.

The description of EASTLAND previously quoted from *The Marine Review* of 1903 indicates that her builders were comparatively inexperienced in the construction of passenger ves-

sels and facts which have been brought out since the disaster tend to indicate that stability calculations were not made by competent engineers at the time the vessel was built.

The Depositors' Savings & Trust Co., which was controlled by Tom L. Johnson, owned \$130,000 worth of the bonds. After two years of operation the bond holders took over EASTLAND. Following the liquidation of the Depositors' Savings & Trust Co. a new company was formed to operate the boat. Peter Witt, now street railway commissioner at Cleveland, was one of the principal officials in this new company. A \$50,000 corporation was formed with a paid-in stock of \$31,300. James F. Mulhol-

land was for a time manager of the boat.

On June 6, 1913, she ran aground on the mud near the East Ninth street pier, Cleveland, and it was after 2 a. m., before the passengers were taken ashore. In one of her first trips, while carrying 2,000 passengers, employes of the Sherwin-Williams Paint Co., the boat went aground near Cedar Point and listed severely.

In the investigation under the auspices of William C. Redfield, secretary of commerce, Capt. Ira B. Mansfield, for many years inspector of hulls in Chicago, testified as follows:

"In 1904 we granted EASTLAND the

various EASTLAND hearings indicates that the water ballast with which the boat was equipped was improperly handled, although this fact should not absolve the owners from blame in that they were operating a boat reputed to be lacking in stability. The testimony of Fred T. Snow, second assistant engineer, is particularly illuminating. It is as follows:

Question.—What was the condition of the ballast tanks when you came aboard? *Answer.*—I think they were empty.

Question.—Whose duty is it to fill or empty the ballast tanks as occasion demands? *Answer.*—The engineer's duty.

Question.—How did you know when to put water in the tanks? *Answer.*—I did not know much about the EASTLAND's ballast system. I

Question.—You say that you had been told that tanks Nos. 2 and 3 were to be used because of their responsiveness. Now, tell us why you didn't use all the tanks when the boat did not respond to Nos. 2 and 3? *Answer.*—Well, we could have tried the rest of them, but the engineer told me to use Nos. 2 and 3.

Question.—When did you leave the engine room? *Answer.*—When the water came in the gangways I crawled out of a hole in the side of the boat and up on the steel deck, where the boat was listing so that my feet slipped from under me.

Question.—Why did you leave the engine room? *Answer.*—To save my life.

Question.—If it took you 17 minutes to attempt to right the boat, was there no talk between you and Erickson (chief engineer) about the failure of the boat to respond? *Answer.*—Very little. Once Erickson said:

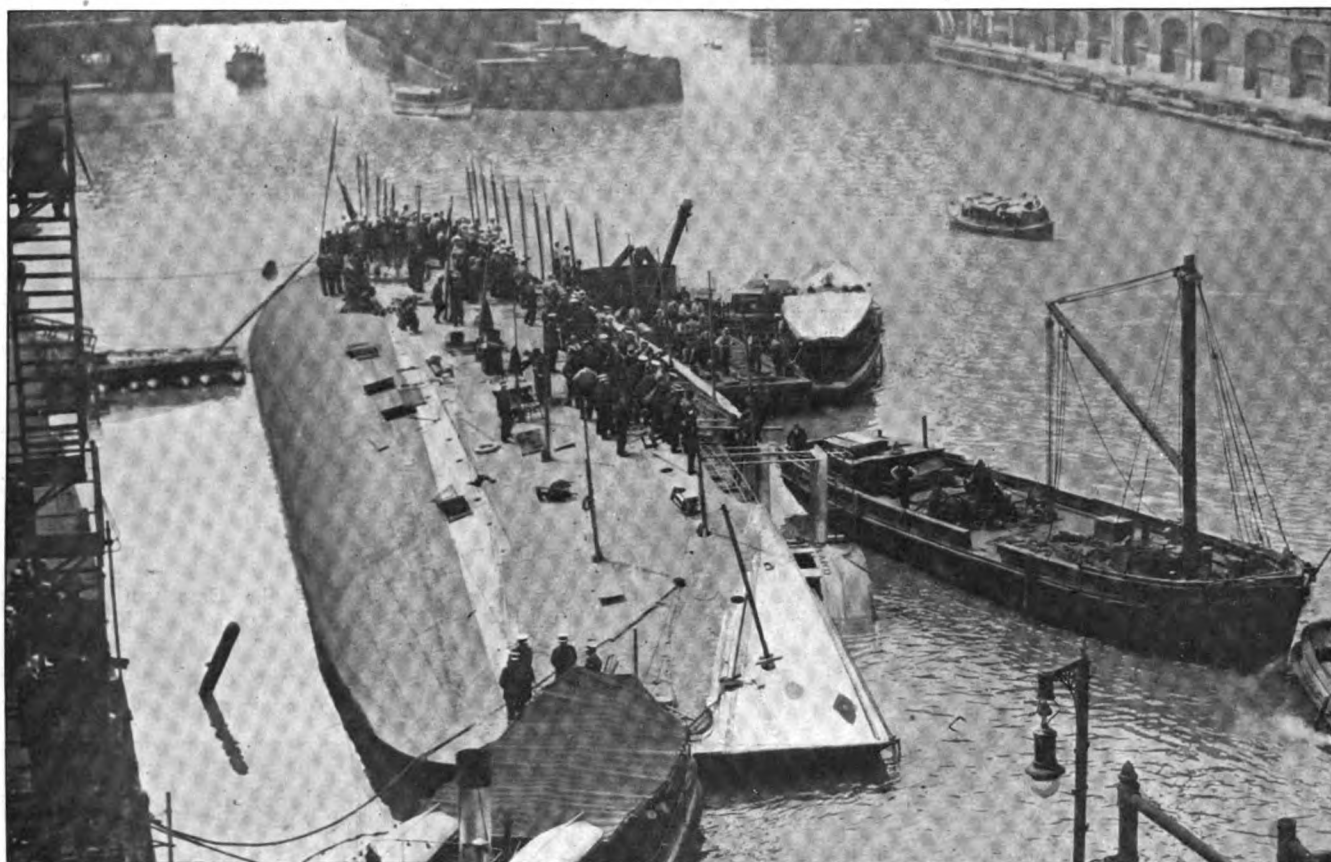


FIG. 6—A GENERAL VIEW OF THE WRECK AS IT APPEARED ON THE DAY AFTER THE ACCIDENT

right to carry 2,800. Later in 1905 and 1906 we gave them 3,000. When EASTLAND had trouble at South Haven she had 2,270 persons on board by counted tickets. I was on board the boat. She listed about 20 degrees, but by putting water in her tanks she was righted and we came across all right. There were about 1,200 persons on the roof. Orders had been given that not more than 600 persons should be allowed on the roof."

"After the listing in 1904 we ordered the captain and chief engineer and the president of the company to keep water in her ballast tanks at all times."

The consensus of testimony at the

had been employed on the boat only two days before the accident.

Question.—What tanks did you use on Saturday? *Answer.*—Tanks No. 2 and 3.

Question.—Why didn't you use all five of the tanks? *Answer.*—The engineer told me to use only two or three, as they responded most quickly.

The witness stated that the water for all these tanks was taken through a seacock on the port side and that this seacock was the only one through which water was drawn for the tanks.

Question.—How long would it take to empty the port tanks? *Answer.*—I don't know.

Question.—How long would it take to fill the starboard tanks? *Answer.*—I don't know.

Question.—Could you fill the starboard tanks and empty the port tanks at the same time? *Answer.*—No.

"I think you've caught her now, all right," but we hadn't.

Peter Erickson, 19 years old, an oiler, testified as follows:

Question.—Did you ever have anything to do with the water ballast? *Answer.*—Yes, when we are near the engineer tells us to open the valves or to close them.

Question.—Did you do so Saturday morning? *Answer.*—Yes. It was about 6:30 o'clock. The second assistant engineer, Mr. Snow, told me to open the ballast pump valves on tanks Nos. 2 and 3 on each side while he saw to the pump. We did, and the tanks were emptied.

Question.—Was that a new procedure? *Answer.*—No, we always did that every morning while in the harbor of Chicago, and usually on the other side, too.

Question.—Did you touch the valves again? *Answer.*—Yes, about 17 minutes—maybe more—before the boat went over I was ordered to



FIG. 7—CUTTING OUT PLATES FOR RESCUE PURPOSES WITH AN OXY-ACETYLENE TORCH

fill the second and third tanks on the starboard side. The engineer sent Mr. Snow to the valve at the seacock and I opened the valves at the manifold, from which lead pipes to all of the tanks.

Question.—Tell what happened then. *Answer.*—Well, I opened Nos. 2 and 3 and stood there waiting for further orders. It listed a little more and finally went quite a little. Then the list stopped. The engineer said: "Well, I guess we've got her."

Question.—Did you ever use the port tanks as ballast to tip the starboard gangway up nearer to a level with the docks? *Answer.*—Yes, often.

Owing to the fact that they have been recommended for indictment, Capt. Pedersen and Chief Engineer Erickson have not given any formal testimony as yet. Erickson, however, is reported to have made the following statement: "We were listing for 17 minutes before we started. I was flooding the right side of the boat. I had five water ballast tanks on each side of the boat. I was working only through two tanks on each side. I thought two were enough."

Robert Reid, Grand Haven, Mich., steamboat inspector, testified that Eastland had two rows of ballast tanks in the hull with five tanks on each side. These tanks are separated by longitudinal and transverse bulkheads. Mr. Reid and other members of the steamboat inspection service testified repeatedly that the law does not permit them to examine the stability of vessels.

Eastland Listed in 1904

Capt. Frank A. Dority testified before the federal board as follows: "I was in command of EASTLAND during 1903, 1904, 1905 and 1906. I have been a master 26 years and am now in

command of CITY OF SOUTH HAVEN."

Question.—State your experiences with the steamer EASTLAND while you were its commanding officer. *Answer.*—In July, 1903, Capt. John Prugh brought out the steamer EASTLAND. I took charge about the middle of the season. I had no trouble with it until about the middle of 1904, when in trying to cross the South Haven bar without water ballast it careened, and we arrived in Chicago 40 minutes late. I consider EASTLAND a safe vessel under all circumstances if it has water in its ballast tanks and if it is properly distributed.

Question.—Was not it a fact that EASTLAND was a cranky boat when you were captain? *Answer.*—Yes, she was cranky, but only when her water ballast was improperly handled.

The witness stated that in his opinion the practice of increasing a boat's capacity on an affidavit of the ship's

master that the proper equipment was on board is not an evil practice. "It is an accommodation, and a personal examination by the inspectors usually follows immediately," he said.

In the examination under the auspices of Secretary Redfield, Capt. Niles B. Nelson, supervising inspector of the ninth or Cleveland district, testified as follows: "The EASTLAND was in my district in 1907, 1908, 1910, 1911, 1912 and the spring of 1913. On June 4, 1907, more than 2,300 newsboys went for a trip out of Cleveland on the boat. They nearly all climbed to the top deck, and I concluded during the trip with them that the boat was a good one and was carrying a good load. I had persons say to me, however, that the boat was a 'cranky' one, although there was no formal complaint."

Capt. Nelson said that the first excursion certificate issued to the EASTLAND allowed her to carry 2,200 and that, after observing the boat, both at dock and in the lake, he increased her excursion capacity to 2,400. Later the boat's capacity was reduced to 2,200, where it remained until 1912, when it was decreased to 2,000.

Necessary to Use Ballast Tanks

"I would never have granted the boat 2,000, 2,200 or 2,400 if I had thought the water ballast tanks would not be used. A boat which is provided with ballast tanks should use them. I talked with the two chief engineers of the EASTLAND who were employed while she was in my district—Grant and Donaldson—about the use of the tanks and cautioned these two engineers along with her



FIG. 8—DIVER EXPLORING INTERIOR OF WRECK IMMEDIATELY AFTER ACCIDENT

other officers to use the ballast tanks, and they all agreed with me and promised me to use the tanks."

Question.—Was the boat safe for 25 years, do you think? Answer.—I not only think so, but I know so.

Question.—Another genius has found that the EASTLAND had no keel. Do you agree with him? Answer.—No.

Question.—Captain, do you mean to say that the only method you use to determine the capacity of a lake steamer is to load a certain number aboard and then observe them?

Answer.—Personal observation is what I rely upon.

Question.—You knew that the EASTLAND was unsafe for 2,400 if the ballast tanks were not used. Did you tell the owners of your belief as well as the captain and the chief engineer?

Answer.—No.

Question.—When you granted the increase to 2,400 did you grant it provided that the ballast tanks were used? Answer.—No; I would not think of granting the increase on those grounds any more than I would have granted it on condition that the boat's safety

dock at about the center of the vessel the depth was 172 feet.

"Do you think the boat could have grounded?" asked one of the examiners.

"I think it unlikely," Col. Judson answered.

"What is the depth of water at the stern?"

"About 23.4 feet."

The testimony regarding the number of passengers admitted to EASTLAND is exceptionally clear and it is evident that not more than the legal limit of 2,500 was on board at the time of the accident. Robert H. McCreary, 47 years old, deputy collector of customs, Chicago, in charge of navigation inspectors, testified as to the number of people aboard EASTLAND. He explained that the naviga-

the only one of the numerous investigating bodies examining the EASTLAND affair that has made any definite report was the Cook county coroner's jury operating under the direction of Peter Hoffman, coroner. The finding of the jury is as follows:

"The drowning was the result of the overturning of the steamer EASTLAND while tied to the dock on the south side of the Chicago river immediately west of the Clark street bridge.

"We recommend that the following persons be held to the grand jury on the charge of manslaughter and for such other offenses as the facts may warrant:

WILLIAM H. HULL, vice president and general manager of the St. Joseph-Chicago Steamship Co., owner of the steamship EASTLAND, St. Joseph.
CAPTAIN HARRY PEDERSEN, St. Joseph, Mich., of the steamship EASTLAND.
JOSEPH N. ERICKSON, St. Joseph, Mich., chief engineer of the steamship EASTLAND.



FIG. 9.—WM. C. REDFIELD, SECRETARY OF COMMERCE AND GEORGE UHLER, SUPERVISING INSPECTOR GENERAL OF THE STEAMBOAT INSPECTION SERVICE DISCUSSING THE ACCIDENT WITH CAPT. N. B. NELSON, SUPERVISING INSPECTOR FOR THE CLEVELAND DISTRICT
Courtesy of The Chicago Tribune.

lights be kept burning at night, or that water be kept in the boilers.

Question.—Capt. Nelson, could you, if you were ordered by the government, calculate the metacentric heights of vessels in your district with your present force? Answer.—No, we could not do it. It takes too long a time.

Question.—Has it ever been suggested to you that it should be a part of the government's inspection functions? Answer.—Yes, and I think it should be.

With regard to the contention that EASTLAND may have grounded, the following testimony was introduced at the federal hearing by Lieut. Col. Wm. B. Judson, United States engineer. Col. Judson presented a drawing showing the depth of the Chicago river about the sunken EASTLAND. The smallest depth recorded on the chart was 10.7 feet; 15 feet from the

tion inspection is an entirely different service from the steamboat inspection.

"I went on the boat about 7 o'clock on Saturday morning," Mr. McCreary said. "There I saw my two men, Inspectors Oakley and Lobdell, in charge on the gangway. I watched them until they had reached 2,450. W. K. Greenebaum was there and he asked me about the count several times. When the count reached 2,450, I took Oakley's place and counted to 2,495. Then we shut off the garg-way until only one could come aboard at a time, and I told Inspector Lobdell to let on five more. Four women and a babe came aboard and I counted the babe as the two thousand five hundredth person to come aboard EASTLAND."

Up to the time of going to press

WALTER K. GREENEBAUM, Chicago, Ill., general manager of the Indiana Transportation Co.
ROBERT REID, Grand Haven, Mich., United States local steamboat inspector.

CHARLES C. ECKLIFF, Grand Haven, Mich., United States local steamboat inspector.

"Nothing in the testimony offered before this jury indicated that the passengers were guilty of any unusual act that contributed to the disaster, and we are of the opinion that no act of the passengers was responsible for the disaster.

"In the absence of evidence of undue acts on the part of the passengers or violent physical causes, such as explosions, fire or collisions, the fact that this vessel overturned is proof either that it was improperly constructed for the service employed or that it was improperly loaded, operated or maintained, or that sev-

eral or all of these causes operated to bring about the serious result.

"It is our judgment that the steamship EASTLAND was both improperly constructed for the service employed and improperly loaded, operated and maintained, and that the parties named are responsible.

"We recommend to the state's attorney and the grand jury that an investigation be made of the corporation or individuals responsible for the management of this boat with a view to discovering if other members of the corporation or other individuals were responsible for acts contributing to this disaster.

"We further recommend that the state's attorney and grand jury investigate carefully the circumstances of construction of this boat to ascer-

the construction of vessels for use by common carriers is unscientific and a menace to public safety. There is not now, nor has there ever been, an inspection service maintained by the federal government for the purpose of determining the stability of boats offered for passenger service. It is the judgment of this jury that the present method of determining the passenger-carrying capacity of vessels is not founded on any proper basis.

"In recommending that Inspectors Reid and Ecliff be held to the grand jury, we recognize the possibility that the courts of Illinois may not have jurisdiction over them. Should the courts of Illinois not have jurisdiction we recommend to the department of justice of the United States that they undertake to mete justice to these parties.

"The verdict was found in the inquest in the case of Kate Austin et al. The members of the jury were Colonel Henry A. Allen, Harry Moir, J. S. Keogh, Eugene Beifeld, William F. Bode and Dr. W. A. Evans, foreman.

An Aftermath of Hysteria

As in every other great disaster the EASTLAND tragedy has been followed by an aftermath of hysteria and unscrupulous politicians, labor officials and others have not hesitated to take advantage of the state of the public mind to further their own selfish ends and ambitions. Five different and conflicting investigations have been started when one under competent supervision would be entirely sufficient. There is a clash of authority between state, city and federal officials. State and county officers have been unusually ubiquitous, in spite of the fact that it is very doubtful if any authority except the federal government has power to act in the matter. Maclay Hoyne, state's attorney for Cook county; Barratt O'Hara, lieutenant governor of Illinois, and Kenesaw M. Landis, judge of the federal court, have been prominent among those instituting investigations and none of these gentlemen have a political record which would indicate that they are specially fitted for the task they have undertaken. The chief concern of some of these gentlemen heretofore seems to have been to get votes and to keep them, and their actions in the EASTLAND affair indicates that they have not forgotten this very important matter at this time.

Wm. C. Redfield, secretary of commerce, who came to Chicago to supervise the investigation under the auspices of the federal steamboat inspection service, also made mistakes, although it is evident that he was more sincere in his efforts to seek the cause of the disaster and to suggest means for preventing its recurrence than some of the other investigators of local fame who seem to be most in-

terested in playing on the passions and feelings of their constituents. Secretary Redfield's attitude in the early stages of his investigation was unnecessary, and his anxiety to defend the steamboat inspection service was out of place, but Mr. Redfield has made some suggestions which are worthy of consideration. They are as follows:

That there shall be created a board of naval architects whose duty it shall be to pass upon plans and specifications of steam merchant vessels over 100 tons burden.

That no steam merchant vessel of over 100 tons shall be certified for service until its plans and specifications shall have been approved by the



FIG. 10—ROBERT REID, U. S. STEAM-BOAT INSPECTOR UNDER FIRE FOR GRANTING EASTLAND PRIVILEGE OF CARRYING 2,500 PASSENGERS

tain if there can be found legal methods by which those responsible for its defects in construction can be held accountable.

"We further recommend that the state's attorney and the grand jury investigate the details of purchase and sale of the different common carriers which have owned EASTLAND with a view of determining, if possible, whether knowledge of the instability of this boat and the hazards attendant thereon, have been known to the seller and have not been disclosed by the sellers to the purchasers, and whether the various purchasers of this boat have discharged their duties as common carriers in investigating the stability and freedom from hazards of the steamer EASTLAND.

"It is our opinion that the federal government's system of permitting



FIG. 11—W. K. GREENEBAUM, GENERAL MANAGER INDIANA TRANSPORTATION CO., CHARTERER OF EASTLAND ON THE ILL-FATED DAY

board, nor until its safety, seaworthiness and stability have been demonstrated to the satisfaction of said board.

That methods shall be provided whereby findings of local inspectors may be appealed.

That whenever the passenger carrying capacity of a vessel is increased by local inspectors the increase must be approved in writing by the supervising inspector.

That any alterations of original plans and specifications affecting stability, seaworthiness and safety must have the approval of the board of naval architects.

Pending enactment of legislation covering those recommendation changes in regulations are urged as follows:

That increases in passenger-carrying permits must be issued by inspec-

tors only after personal inspection of the vessel and a written report made.

That inspectors require owners of vessels whose stability they have any reason to question to make "inclining tests" on such vessels.

Secretary Redfield also has announced a special board consisting of supervising inspectors to conduct a searching investigation of conditions for the past several years. This board is to consist of Supervising Inspectors N. B. Nelson of Cleveland and C. H. Westcott of Detroit, together with H. M. Seeley, of New York; John A. Cotter, of New Orleans, and John K. Bulger, of San Francisco.

As suggested on the first page of this issue of *The Marine Review*, it is believed that all of the maritime interests of the country should be placed under the control of a board of experts and this should certainly include the steamboat inspection service. Undoubtedly the steamboat inspection service should be investigated but the public will have no confidence in an investigation by the service itself.

Political Hot Air

The following dispatch from Washington regarding the political aspects of the EASTLAND affair is exceedingly illuminating:

"When United States Senator J. Hamilton Lewis, of Chicago, wired Secretary of Commerce Redfield that it was believed in Chicago that the departments of commerce and justice were attempting to suppress the truth in the steamer EASTLAND matter and when he urged immediate activity in order to save the administration, he was showing something of the same hysteria that has already been evidenced by others.

"Andrew Furuseth, president of the seamen's union—all of whose men,

by the way, escaped from EASTLAND—did likewise when he declared the accident was 'due to the rottenness and inefficiency of the steamboat inspection service'.

"Senator La Follette's personal representative, John Hannan, did the same when he charged that the tragedy was the 'result of the vessel

disaster—fire and capsizing—the seamen's law is mute.

"The seamen's law has absolutely no bearing on a case like the EASTLAND."

Another inspired citizen has made the statement that there isn't a boat traveling on the Great Lakes that is as safe as it reasonably ought to be. Any one at all acquainted with the facts knows that such an assertion is viciously false. It is a fair example, however, of the loose, irresponsible statements that are made by men who should have more discretion at times of great public calamities.

Padded Bottle

Who padded the water bottle? Discover that and you will have disclosed the navy's latest and greatest mystery.

This bottle was one of two with which the superdreadnaught ARIZONA, launched from the New York navy yard, on June 19, was to have been christened, one containing wine and the other, as a concession to the prohibitionists, containing water.

The wine bottle broke, but the other didn't. Then, after it was all over, there were whispers that judicious padding had saved the water bottle. So it was to the great joy of the sailormen, and the equally great chagrin of the prohibitionists, that the giantess went overboard christened in the old way.

An unbiased hand, that of young Miss Esther Ross, of Prescott, Ariz., swung the two bottles laced together, against the bow as the great vessel glided down the ways. So vigorous was the swing that the champagne bubbled over a wide expanse.

Indictments Returned

Chicago, Aug. 10. (By wire).—The state grand jury investigating the EASTLAND disaster has returned indictments against six persons connected with the operation of the ill-fated steamer. George T. Arnold, president; William H. Hull, vice president and general manager, W. C. Steele, secretary-treasurer, and Ray W. Davis, assistant treasurer of the St. Joseph-Chicago Steamship Co., owners of EASTLAND, were indicted for manslaughter; Capt. Henry Pedersen, master, and Joseph M. Erickson, chief engineer were indicted for criminal carelessness. Arnold, Hull and Davis are residents of Michigan and have announced they will fight extradition. The state grand jury returned the indictments in spite of the fact that there is doubt if the state of Illinois has jurisdiction in the case. The federal grand jury has not yet reported.

owners' gambling with human lives'.

"And Judge Landis—who jumped to fame by imposing the \$29,000,000 fine on the Standard Oil Co., subsequently revoked by a higher court—is reported to have threatened to appoint a special prosecutor if the United States did not act. The government, it should be added, is acting most thoroughly.

"The same sort of hysteria, political, propagandist and otherwise, is now prevailing as was noted after the TITANIC disaster, after the VOLTURNO, after the MONROE, and after the EMPRESS OF IRELAND. It is the same as followed the SLOCUM disaster in New York. And it always will be the same. The demand, after every such catastrophe, will be 'get somebody.' And in every such case there is some group, seeking some particular goal, who will seek to exploit the tragedy to their own ends.

"In the present instance one of the efforts is to exploit the EASTLAND disaster to prevent repeal of the seamen's law.

"The EASTLAND capsizing, however, has no more to do with the seamen's law than had the terrible fire on the steamer GENERAL SLOCUM.

"Even had the seamen's law been in effect there would have been no different condition on EASTLAND.

"The seamen's law has nothing to say about fire prevention on ships, nor has it anything to say about hull construction. In other words it is mute on all forms of safety save the matter of lifeboats and liferafts. On EASTLAND lifeboats and liferafts were worse than useless. As the ship careened the lifeboats slid from their places and swept many persons into the river. Similarly the lifeboats were useless on SLOCUM. Against these two forms of marine



FIG. 12—J. N. ERICKSON, CHIEF ENGINEER OF EASTLAND



FIG. 13—WM. H. HULL, VICE PRESIDENT AND GENERAL MANAGER

Submarine Attack Swift and Silent

Personal Experience of an Officer in the British Merchant Service Describing How it Feels to be Torpedoed

I AM an officer in the British merchant service holding a first mate's certificate and was recently third officer of a steamer which left the port of Liverpool bound south. The following day we were torpedoed at the mouth of the Bristol channel.

It was late in the afternoon when we passed the Bar lightship and we were congratulating ourselves that we were well clear of all submarine attacks. We little knew that another vessel had been sunk three hours before a similar disaster overtook us. Up to this time all hands had been kept on deck keeping a vigilant lookout for submarines. In addition to the men on the fore-castle head, one was in the crow's nest and two were stationed aft. Our boats were swung out all ready for launching.

Shortly after mid-day I came on deck to relieve the second officer for lunch; the captain was, at that time, on the bridge. It was a lovely clear day and the horizon was plain all around, the sea being quite calm. The second officer remarked to me, as he left the bridge, that we were fortunate in getting clear of the beggars before leaving the Irish coast, but his remark did not make me relax my vigilance.

About 15 minutes after the second officer left me I was standing on the port side of the bridge looking at the water, when suddenly I saw what I first took to be a fish coming to the surface from a depth of 3 or 4 fathoms. Then, like a flash, I noticed that the disturbance of the water increased and I could see the shimmering body of a torpedo coming, as it seemed, from the depths of the sea at an angle of some 45 degrees. I rushed across the bridge and dashed at the engine room telegraph, ringing it to stop. At the same moment a terrific explosion rent the air and the force of it swept up the water like a huge cataract and sent above the height of the funnel a shower which descended upon me, drenching me to the skin. The bridge chart-table and other portable fittings were completely wrecked. By this time I could see bales of sacking which formed part of our cargo floating on the surface of the water, but there were no signs of the submarine or its periscope.

All hands were quickly mustered, the ship slowly sinking by the head. There was no panic. Every man proceeded to

his proper station, the lifeboats were lowered, and the forward part of the ship sank deeper while the stern rose proportionately. At the time the boats were lowered the vessel had a heavy incline forward. In seven minutes every man was clear of the ship and we were able to save absolutely nothing but the clothes in which we stood. Most of us were drenched through by the sea which followed the explosion as it came on board, and we looked fairly miserable objects. It was by no means a warm day but, in the excitement we did not feel the cold at all until we had been in the boats for some time. We pulled away from the ship and it was then, for the first time, we sighted the periscope of the enemy, who had not yet shown his hull.

They were evidently watching us in the boats. They also observed—as we did—that while the ship sank down to a level with her hawse pipes she did not go any deeper. The blades of the propeller were just showing above the water.

After watching our old ship for a little while, we agreed that we would hang on to see if we could save the ship by bringing her back to port. For a few moments the periscope disappeared and we thought that the submarine had gone for good. Unfortunately this did not prove to be the case. We had not progressed more than a couple of hundred yards towards the ship, with the intention of boarding her again, when the submarine rose to the surface between ourselves and the vessel. Her conning tower cover quickly opened, and an officer shouted in English to us to "clear out".

Four or five seconds later another torpedo was fired at our ship, which hit her in the stern and completely shattered the after part of the vessel. A terrific explosion followed the discharge of the torpedo, and we thought that our boats were shaking to pieces, so greatly did they oscillate. We then saw that our ship was doomed, for within a few minutes she began to settle more deeply in the water and before we could row away from the scene she was out of sight.

The submarine which attacked us was a huge vessel and carried a heavily mounted gun aft. This gun was in no way covered up, for before the periscope of the submarine came to the

surface it showed itself in position. The enemy's craft was a long, thin vessel of considerable length. In fact, it looked as large as our own ship when the latter was nearly submerged. The officer in command of the submarine evidently had other work to do, for he did not stay to converse with us or assist us in any way. After he saw that his last torpedo had demolished the ship he quickly closed his conning tower and, with a considerable roaring noise, submerged and disappeared.

We rowed away from the scene and, after being in the boats for some 12 hours, we finally picked up a friendly shelter in the shape of a light vessel, where we remained until the following day, when we were taken off by a passing steamer.

There is one curious feature about this attack on our ship and that is the absence of the submarine's periscope. None of the look-out men saw it and, from the direction in which the torpedo came, I should imagine that the submarine was fitted with some kind of plate glass look-out in the conning tower where she could see the object of her prey through the water. It would have been impossible to have fired at such close range and become submerged without warning us by the noise which I understand is caused by the water entering the tanks and the air escaping. As to her armament, I am ready to state that the gun she carried was much larger than a three-pounder, as I have seen three-pounders, six-pounders, 12-pounders and 4.7 guns, and it looked to me more like one of the latter type than one of smaller caliber. I have no doubt that many merchant service officers have had similar experiences to my own, but, doubtless, others who have not will be interested to read this account.

New York Gains Shipping

A total of 5,243 vessels entered the port of New York from foreign ports during the year which ended July 31, 1915, an increase of 465 over the corresponding period of 1914. More American, Scandinavian, Dutch and Italian vessels, to the total number of 1,055, and fewer German, British and French vessels, to the total number of 590, entered the port, than in the previous 12 months.

Reprinted from the Nautical Magazine, London.

The A B C of the Stability of Ships

A Simple Explanation of the Factors Affecting Safety From
Capsizing—Elements of the Problem Are Not Intricate

VOLUMES have been written on the stability of ships and the details of the subject are exceedingly complex but like most other natural phenomena the physical laws involved are comparatively simple and easily understood. It does not require a knowledge of calculus or higher mathematics to understand why a ship stays right side up under certain conditions and capsizes under other conditions, and if necessary even the most detailed of the calculations necessary to figure the stability of a vessel can be made without straying very far from the realms of ordinary arithmetic.

In view of the disaster which overtook the steamer *EASTLAND* in Chicago harbor July 24 there has been a sudden revival of interest in the general subject of stability and this article is presented for the purpose of explaining the elements of the problem in the simple, non-technical language for the benefit of those who have had no occasion to go into the matter previously. No attempt will be made to go into details, the aim being simply to present the fundamental principles involved clearly and accurately.

A great deal of rubbish has been published in various newspapers on the subject of stability in the past few weeks and a number of utterly absurd diagrams and explanations have appeared which are not only confusing to the non-technical reader but absolutely misleading. While generally speaking a broad, flat boat is more stable than a deep narrow one, it is practically impos-

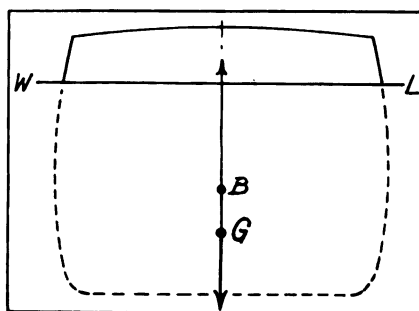


FIG. 1—CROSS SECTION OF VESSEL IN UPRIGHT POSITION AND STABLE EQUILIBRIUM

sible to determine the stability of a large steamer simply by looking at her either in the water or out of it. The shape of the hull gives only general information regarding the actual stability of a vessel; a steamer which appears as solid as a rock may as a matter of fact be exceedingly tender, while another which looks top-heavy, with high upper works, may be as steady as a church.

A ship floats because of an equilibrium between two forces, namely the weight of the vessel acting downward and the buoyancy of the water acting upward. These two forces must be equal as long as the vessel is afloat, regardless of her position. Every floating body sinks into the water for a certain distance and therefore pushes aside or displaces a certain amount of water, and in every case the weight of the water so pushed aside or displaced is exactly equal to the weight of the floating body.

Fig. 1 shows the cross section of a vessel at rest in still water, with the

water line *WL*. We may assume that the weight of the vessel is concentrated at and acts through a single point known as the center of gravity. This point is indicated by *G* in Fig. 1. Also the upward pressure of the displaced water may be considered to be acting through another point called the center of buoyancy. This point is indicated at *B* in Fig. 1. As long as the ship is in an upright position and at rest these two points must be in the same vertical line and the forces of gravity and buoyancy acting through them must be exactly equal.

We will now suppose that an external force acts upon the vessel and causes her to heel over or list as shown in Fig. 2. No weights have been added and therefore the displacement is unchanged, and the volume lifted out of the water on one side must be counter-balanced by the volume immersed on the opposite side; in other words the wedges *WSX* and *KSL*, Fig. 2, are equal. However, the immersed body is now altered in form and therefore the center of buoyancy is no longer at *B* as in Fig. 1 but takes up some new position *B'*, Fig. 2. But inasmuch as there has been no change in the disposition of the weights, the center of gravity *G* is not altered in position. In Fig. 2, as in Fig. 1, however, the weight of the vessel acts downward through *G*, the center of gravity, and the buoyancy of the water acts upward through *B'* which is now the center of buoyancy. The intensity and direction of these two forces are indicated by the

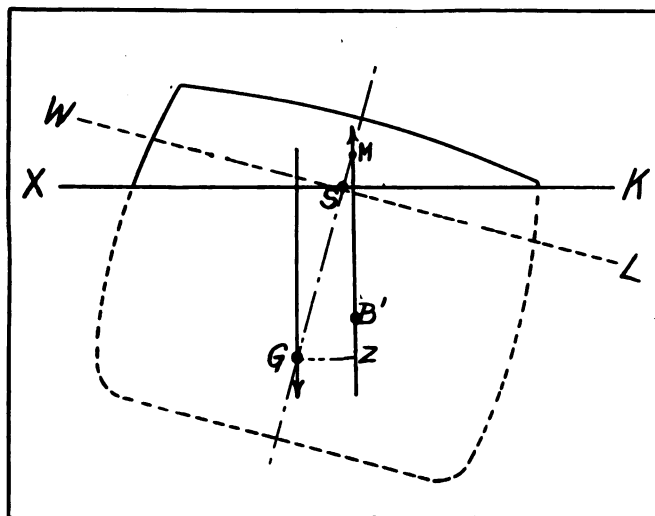


FIG. 2—CROSS SECTION OF VESSEL IN STABLE EQUILIBRIUM SHOWING POSITIONS OF CENTER OF GRAVITY AND METACENTER WHEN LISTED

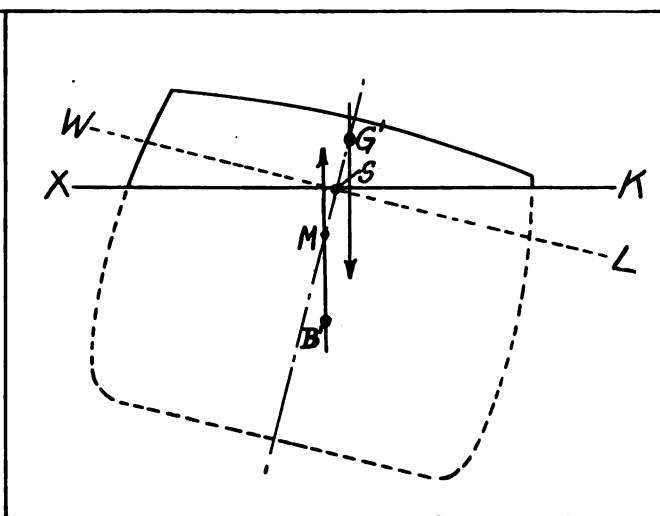


FIG. 3—CROSS SECTION OF VESSEL IN UNSTABLE EQUILIBRIUM SHOWING CENTER OF GRAVITY ABOVE THE METACENTER

arrows in Fig. 2. But, since these forces no longer act in the same vertical straight line, it is clear that a turning force, technically called a moment, is introduced, the intensity of this force depending upon the weight of the ship and the distance GZ between the center of gravity and the center of buoyancy.

The turning moment acting on the vessel in Fig. 2 obviously tends to restore her to the original position and she is therefore said to be in *stable equilibrium*.

Now suppose that the center of gravity is raised from the position shown in Fig 1, say by pumping out a ballast tank and placing a large number of passengers on an upper deck. The new situation thus created is indicated in Fig. 3. The center of gravity having been raised to the position G' , as before the weight of the vessel acts downward through this point and the upward forces of the water acts upward through the center of buoyancy. However, it will be noted that the conditions of equilibrium are the reverse of those existing in Fig. 2, and the turning force or moment tends to roll the vessel over further instead of to return her to an upright position. In Fig. 3 the ship is in *unstable equilibrium*.

Metacenter

Furthermore if we draw a vertical line through B' , the center of buoyancy, it will cut the center line of the vessel at some such point as M . This point M is called the *metacenter* from the Greek word *meta* meaning limit. It will also be noted that in Fig. 2, in a condition of stable equilibrium, G , the center of gravity, is below M , the metacenter, whereas in Fig. 3, under a condition of unstable equilibrium, G' , the center of gravity, is above M , the metacenter. It will also be observed that the distance between G and M is a measure of the stability or instability of the vessel; in other words the farther G is below M , the more stable the ship must be and the further it is above M the more unstable the vessel is. Under all circumstances, if the vessel is stable, and if she is to return to an even keel after listing, M , the metacenter, must be above the center of gravity. The distance GM or $G'M$ is called the *metacentric height*. When the center of gravity rises to a position above the metacenter, producing a condition of instability, the vessel is said to have a negative metacentric height. It is obvious that a passenger vessel should be so designed that it cannot have a negative metacentric height under any possible conditions of ballasting or loading. George Nicol in his book entitled "Ship Construction and Calculations," makes the following interesting state-

ment: "The great importance of the points G and M are manifest and a ship master *ought to know* for every condition of lading of his vessel, in which he may have to put to sea, what GM or metacentric height he has available. A knowledge of a vessel's metacentric height is useful for many purposes. It is an excellent guide, for instance, in determining whether or not a vessel may be safely shifted in harbor, whether ballast tanks should be filled, or in a case of a vessel carrying oil in bulk how the loading of cargo should be proceeded with. Besides the foregoing, if the vessel be of a known type, the metacentric height will furnish a good basis from which to predict the probable nature of her stability at large angles of inclination."

Continuing the author states, "The question of a minimum value of GM has been the subject of much debate and difference of opinion. Those who have favored a large value have been confronted with the fact that great stiffness conduces to bad behavior at sea.

On the other hand, a very small value indicates a crank vessel and maybe, although not necessarily so, an altogether unsafe one. The only secure manner of dealing with vessels in this respect is to compare them with others whose performances at sea are known and to adopt values of metacentric height thus suggested. There seems to be a consensus of opinion in favor of limiting the minimum value of GM (metacentric height) in steamers of about medium size to one foot when filled with a homogeneous cargo which just brings them to the load waterline. Cases are on record of vessels having given a good account of themselves with a smaller metacentric height, when loaded as above. In one oft quoted instance, the metacentric height was as low as 0.6 feet, yet the vessel proved herself in every way a good sea boat. The natural feeling however is to have a margin on the side of safety and this is considered to be provided in ocean going steamers when the metacentric height has the minimum value given above."

Calculations Not Difficult

For angles of inclination up to 10 degrees the metacentric height may be computed by comparatively simple methods with which every ship master should be familiar. At large angles of inclination, however, the position of the metacenter changes rapidly. Nevertheless, the physical laws at work are unchanged and the calculations necessary to determine the stability of a vessel at a large angle of inclination are not sufficiently difficult to discourage a

man having the intelligence of the average master or mate of a seagoing ship. In the design of a vessel, the two most important factors affecting the metacentric height are the beam and freeboard. In similar shaped vessels the metacentric height varies as the square of the beam; in other words, if we have two vessels which are similar except that one has 20 feet and the other 40 feet beam, the latter will be four times as stable as the former. The freeboard, or the distance between the waterline and the lowest opening in the hull through which free water might be admitted if the vessel listed, also has a powerful influence on the stability. It is readily seen that if a vessel has a high freeboard and is stable, the further she lists the greater will be the force tending to restore her to an upright position. If the freeboard is low, however, free water may be admitted to the hull after a slight initial list, rapidly lowering the metacenter and eventually resulting in an accident.

The position of the center of gravity of course has a tremendous influence on the stability of a vessel. Furthermore, to a great extent the position of this point is dependent upon the nature of the stowage. A ship master may therefore often make the stability of his vessel what he pleases. If he finds that she is deficient in stability, he cannot correct the defect by increasing the beam or the freeboard, but he can, it may be, stow heavy weights low down in the hold and lighter ones higher up and by thus lowering the center of gravity attain a satisfactory result.

To Salvage Emden

The Australian commonwealth government has called for tenders for the salvage of the German cruiser EMDEN, as she lies beached and battered in the Cocos islands. The minister of defence recently announced that, "tenders are invited for the salvage of the EMDEN as she now lies stranded on North Keeling Island. Tenderers must undertake to forward to the navy office at Melbourne, and hand over, free of charge, all guns and gun-mountings, torpedoes and torpedo tubes, fire-control instruments and apparatus, money in whatever form, and all confidential books and documents that may be salvaged. Should the ship herself be salvaged and brought into port, the commonwealth government is to have the option of purchasing the ship at a price to be determined by arbitration in the event of any dispute arising. All information available at the navy office as to present condition will be supplied on application to the naval secretary. Tenders must state terms and time."

Isherwood System of Construction

How the Appendages Affect Actual Measurements—
Their Effect in Determining Displacement of Vessels

By Robert Curr

THE table for displacement, which was published in last month's issue of *The Marine Review*, was for the molded measurements. To obtain actual measurements, the parts beyond the after perpendicular must be also added to the table for displacement. In Fig. 1, the stern post, shoe and

*This is the twenty-sixth of a series of articles on the Isherwood system of construction which began in the September, 1912, issue of *The Marine Review*. The first article dealt with the general specifications of the steamer; the second with the sheer, half-breadths and body plans; the third explained the method of getting the sheer; the fourth dealt with the longitudinal and transverse framing; the fifth with offsets; the sixth with the shell plating; the seventh with the shell plating expansion; the eighth with the arrangement of plates and angles forming the

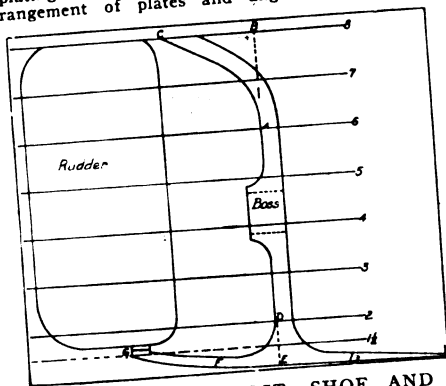


FIG. 1—STERN POST, SHOE AND RUDDER

spar deck; the ninth with the transverse; the tenth with bulkhead construction; the eleventh with the connection of longitudinal frames to the bulkheads and transverse; the twelfth showed the interior framing between the tank top and spar deck; the thirteenth showed the amount of work that can be put together in a Great Lakes ship yard in a few hours; the fourteenth showed details of riveting in shifts of butts; and fifteenth considered the subject of butts, straps and laps; the sixteenth discussed Lloyd's rules and their application; the seventeenth showed certain details of the transverse and longitudinal system; the eighteenth gave calculation for the neutral axis and movement of inertia for the transverse framed vessel; the nineteenth showed the materials in the section of the Isherwood vessel; the twentieth showed the arrangement of framing in the engine space extending from frames 24 to 30; the twenty-first showed the bow plating and framing; the twenty-second showed the stern construction abaft No. 30 bulkhead; the twenty-third showed the arrangement of plating on the tank top and expanded plates on the side; the twenty-fourth covered the subject of damage due to grounding and the twenty-fifth presented a displacement sheet.

rudder below the 14-foot waterline, are shown. The after perpendicular cut-off is shown by the dotted lines *AB* and *DE*. The appendages are *ABC*, *DEFG* and the rudder. The waterlines are shown by the numbers 1, 1½ to 8. Fig. 1 is illustrated at an angle of 30 degrees in Fig. 2. The part *A* is the appendage *ABC*, Fig. 1, and measures 13 cubic feet. The shoe is shown at

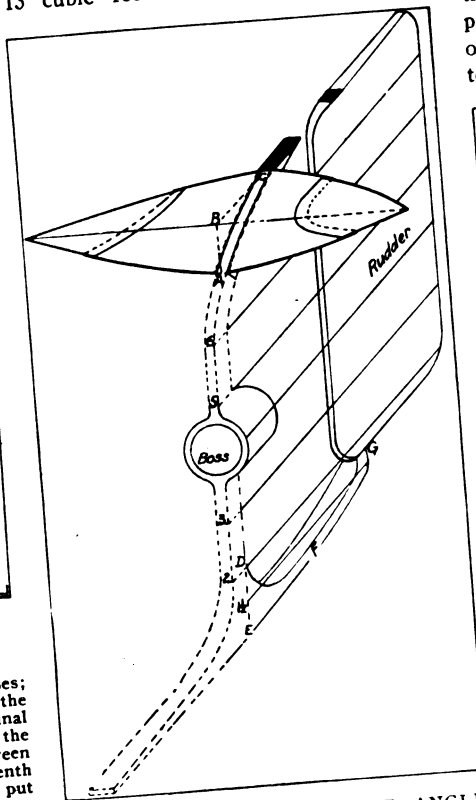


FIG. 2—SHOWING FIG. 1 AT ANGLE OF 30 DEGREES

DEFG and measures 24 cubic feet. The boss is treated as a cylinder and has a capacity of 5 cubic feet. The rudder has a capacity of 25 cubic feet. Thus,

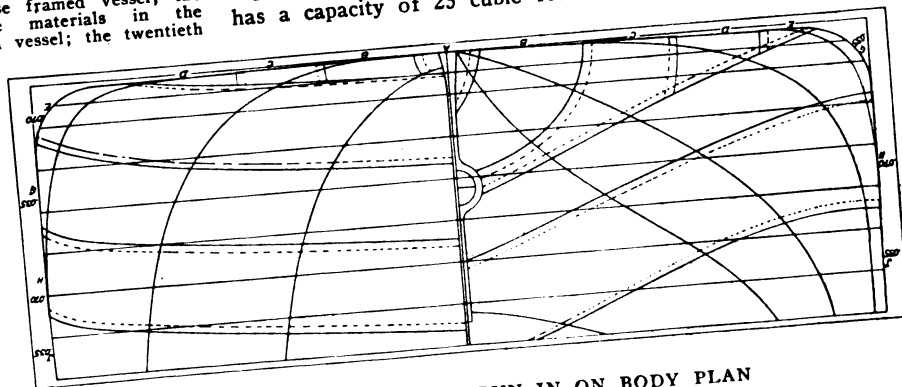


FIG. 3—SHELL PLATING RUN IN ON BODY PLAN

the total of appendages is 45.4 cubic feet. The stem, drawn from the fore perpendicular aft, is shown in Fig. 5. It will be observed that the space between the stem and fore perpendicular does not help the displacement and, of course, should be deducted. Fig. 4 shows this deduction more clearly. The waterlines 1, 1½, etc., are shown in their true form. The dotted lines running from the various points to the fore perpendicular, give an idea of the amount of lost displacement. The triangles *A* to *H* from the load waterline, amount

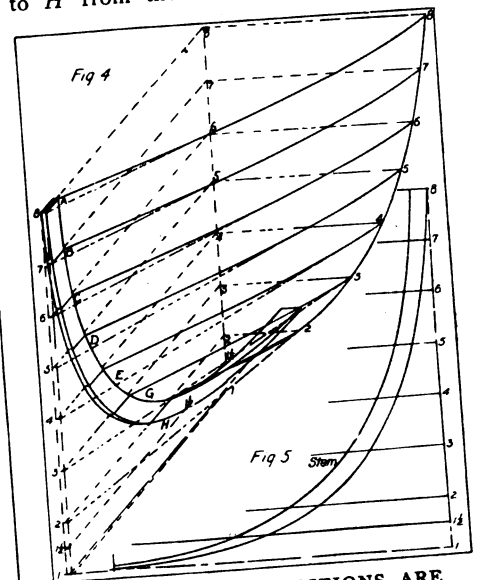


FIG. 4—HOW DEDUCTIONS ARE CALCULATED
FIG. 5—STEM DRAWN AFT FROM FORE PERPENDICULAR

to 51 cubic feet. In this case, therefore, the omitting of the after appendages would overcome the excess for the fore end between the stem and perpendicular.

Fig. 3 shows the shell plating run in on the body plan and, of course, adds to the molded calculations. In this case the plating is run in on the frames and the widths over the plating are measured as if they were the only ordinates. In the fore body waterline, 1½ measures on *E*, an outside stake, 0.070 feet.

In the afterbody, it intersects *G* strake, which is an inside strake, being only 0.035 feet greater than the molded width. The result of this calculation increases the displacement by 17.53 tons.

Launch Navy's Biggest

The battleship *ARIZONA* was launched at the Brooklyn navy yard at high tide on June 19. Her sponsor was

AQUADON is fitted with four watertight bulkheads, which divide the vessel into five compartments. The first of these compartments is used as a chain locker, the second and third are utilized as tanks for the fresh water cargo, the fourth is the engine room, and the fifth is the fuel oil storage tank. From this tank a clock pump fills a fuel service tank in the engine room, which feeds the fuel injection pumps on the

tical inside diameter from nine to five inches to fit the new shaft installation. *AQUADON* is owned and operated by the Boston Provision & Ship Supply Co.

Fewer Vessels Built

IN VIEW of the many British merchant ships lost since the war began, it is at first glance rather surprising to learn that the gross tonnage and number of commerce carriers now under construction in ship yards of the United Kingdom is materially less than a year ago. Much of the usual merchant vessel building facilities are now occupied with naval construction, and a large percentage of skilled workmen are either at the front or in government service, so that the loss of about 215,000 gross tons is comparatively small. Returns compiled by Lloyds register of shipping, which only takes into account vessels of 100 tons or more, construction on which has actually begun, show that, excluding warships, 442 vessels, of 1,506,925 gross tons were under construction in the British isles on June 30. This is about 215,000 tons less than the corresponding tonnage for June 30, 1914. Detailed figures are as follows:

Description.	June 30, 1915.		June 30, 1914.	
	No.	Gross tonnage.	No.	Gross tonnage.
Steam.	434	1,505,025	463	1,717,747
Steel .....	...	...	...	...
Iron .....	...	...	...	...
Wood and composite ..	...	...	...	...
Total	434	1,505,025	463	1,717,747
Sail.				
Steel	6	1,450	13	4,277
Iron .....	...	...	...	...
Wood and composite....	2	450	1	100
Total	8	1,900	14	4,377
Total steam & sail	442	1,506,925	477	1,722,124

Miss Esther Ross, of Prescott, Ariz. As the *ARIZONA* stands she weighs 13,000 tons and is about 65¾ per cent completed. She represents a cost of \$7,425,000, and when fitted with guns, armor and other equipment will have cost the government \$16,000,000 or more. The vessel's dimensions are: Length, 608 feet; beam, 97½ feet; draught, 28 feet 6 inches. Her armament will consist of twelve 14-inch rifles, twenty-two 5-inch rapid fire guns, four 6-pounders for saluting, three 3-inch field pieces and four aeroplane guns. *ARIZONA* will be fitted with turbine engines.

engine. A water tank to supply the water injection pumps on the engine, the starting air tank, and a whistle air tank are also installed. A pump to facilitate handling the water cargo, situated in the engine room, is driven by the main engine, the exhaust gases of which are carried up through mufflers into a funnel 12 feet in height.

In installing the new engine, the foundation was stiffened by additional plates. Bushings were fitted in either end of the stern tube, reducing its prac-

Fuel Oil Replaces Steam

THE recent successful trials of *AQUADON*, a New York harbor water boat which has been fitted with fuel oil engines, have aroused considerable interest in the vessel. *AQUADON* is 105 feet long, with a beam of 22 feet, a draft of 9 feet 3 inches, and a load displacement of 270 tons. Her new engine is a four cylinder, 100-horsepower, direct reversible Bolinders, a Swedish engine of the so-called semi-diesel type, which burns fuel oil. It is said that on her trial trip the vessel attained a speed of eight knots per hour without load, and of seven knots per hour with load, at a fuel consumption of 63 pounds of oil per hour. A feature claimed for the Bolinders engine is the ability to start on low air pressure, it being stated that the pressure in the starting air tanks during *AQUADON*'s trial trip did not exceed 120 pounds.

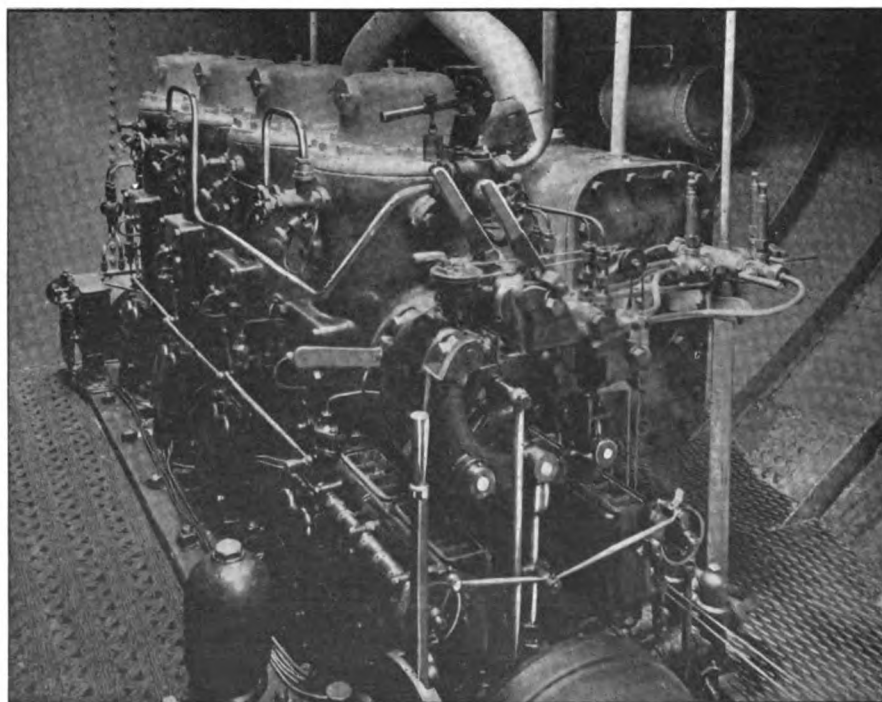


FIG. 2—*AQUADON*'S FOUR-CYLINDER, 100-HORSEPOWER BOLINDERS ENGINE



FIG. 1—BOLINDERS EQUIPPED WATER BOAT *AQUADON* ON HER TRIAL TRIP IN NEW YORK HARBOR

In the Traffic Manager's Office

A Review of the Charter Market on Coasts and Lakes—Pointers
for the Men Who Get the Business

Many New Steamship Lines Established

By F. A. Churchill Jr.

THAT Americans are now fully awake to the possibilities of coastwise and South American maritime commerce is strikingly evident from the numerous new steamship lines organized for these services in the past few weeks, as well as extensive additions to the fleets of existing lines. Besides many vessels now nearing completion for well-known shipping firms a number of foreign steamers have been or shortly will be transferred to American registry. Several lines have announced their intention of inaugurating frequent and regular service to the Pacific northwest via the Panama canal; others are extending their South American traffic; and at least one alert southern neighbor is returning the compliment, by commencing a schedule between Callao, Peru and the Atlantic ports of this country. Alaskan and Hawaiian services are being augmented as well. The present activity in maritime circles appears to be thoroughly justified by the demand for greater shipping facilities, and the next few months will probably witness further developments of equal interest.

Plan Pan-American Line

The Peruvian Steamship Co., Callao, Peru, which owns and operates a line of modern, oil-burning steamers, principally between Peruvian ports and Panama, recently for the first time sent one of its passenger steamers, MANTARO, 4,617 gross tons, to Baltimore, via the Panama canal. She carried passengers and a cargo of 3,000 tons of nitrate, silver ore, silver sulphide, zinc, Peruvian cotton, wool, skin, hides and rubber from Iquique, Chile. MANTARO returned to Callao via the canal with coke and other American products. The company later sent another of its steamers, PACHITEA, of the same class as MANTARO, to Baltimore.

The management of the line is especially interested in the development of passenger traffic on this route.

The trip may be made in about 15 days without changing steamers. It is probable that permanent service will be established to Atlantic ports in the United States. The schedule for all ports these vessels will touch will be determined by the cargoes and passengers carried. The new line will probably ply regularly between Baltimore and Valparaiso, Chile, on a 17 to 18-day schedule. The regular southern schedule, giving the port in Peru as the first point of call, will require 14 days from Baltimore. Stops may be arranged for points in Ecuador. Other vessels of the fleet, UCAYALI and HUALLAGA, will make weekly trips between Valparaiso and Panama.

Shortly after the beginning of the war, three steamers of the Peruvian company were withdrawn from the regular service, as the sudden and sharp decline in freight and passenger traffic made the existing weekly itinerary north and south unprofitable. Later, when the world-wide shortage of tonnage sent freight rates upward, the line procured its government's consent to dispatch the steamer URUBAMBA, 4,757 gross tons, to Liverpool with high-grade ore, cotton and copper. The steamer proceeded from Liverpool to Baltimore, where she loaded coke and general cargo for Peruvian ports.

Standard Organizes Line

The Standard Oil Co., of New York, has completed plans for increasing its shipping facilities, through the creation of the Standard Transportation Co., incorporated in Delaware recently with a capital of \$15,000,000. Its officers, including Otto Halenbeck, president, and Alfred Renshaw, vice president, have been connected with the export trade of the Standard of New York for many years. The old organization is a marketing company solely, and in export lines distributes refined oil products in the far east and Turkey. It has transferred to the transportation

company its fleet of 25 vessels, including six ocean freighters and six ocean-going tugs. Four large tank steamers will be added, two to be delivered next summer and two the summer following. The lighterage business at New York has been taken over by the transportation company.

While the fundamental purpose of the new company is to assist the transportation of Standard Oil Co. products from refinery to the retail markets, its charter makes provision for other important departments of the shipping industry. Under the Delaware charter, the company may erect and operate warehouses and wharves for the storage of petroleum products and ships' stores. It is understood that the stock of the Standard Transportation Co. will be held by the Standard Oil Co., of New York.

Launch Chinese Steamship Line

Five or more modern steamers, equipped for passenger and cargo traffic, and constructed on lines similar to those of vessels now operated in the trans-Pacific service by the Nippon Yusen Kaisha, to follow the semi-tropical route and make regular calls at Honolulu both outward and homeward, will go into commission within a year, says Fung Sui, representative of a company of Chinese capitalists. That the Chinese republic has guaranteed a generous subsidy to the company for the operation of freight and passenger carriers, was recently asserted. Much of the capital was subscribed in south and central China.

The vessels will make Shanghai a terminal port. The route may be extended to include a visit to Hongkong, and possibly to Manila. They are expected to fly the Chinese flag and will, with but few exceptions, carry an entire complement of Chinese as officers and crew. Two steamers are expected to enter the trade within a short time. It is possible that they may be purchased on the

East coast, in order to hasten the development of the company's business. The East Asiatic Co. will enter the trans-Pacific service between San Francisco and Japan, China and Vladivostok. The steamer *INDIEN*, which has been running between Copenhagen and San Francisco, will be loaded for the Orient in a few weeks.

Agents of the Pacific Steam Navigation Co. and of the Royal Mail Steam Packet Co. have announced that a fortnightly service between New York and the west coast of South America will be begun by way of the Panama canal, as soon as the steamers intended for that service are released by the British government from transport work. The fleet will consist of several 15,000-ton steamers, each with accommodations for 1,000 passengers.

The steamship *TAMPICO* was the pioneer vessel of the Oregon-California Shipping Co., recently organized to operate a line of steamers regularly between New York, Philadelphia, San Francisco and Portland, Ore. *TAMPICO* sailed from Brooklyn, N. Y., Aug. 17, and from Philadelphia, Aug. 21. She will be followed this month by the steamship *EUREKA*.

The American-Hawaiian Steamship Co. announced recently that the first of three steamers under construction for the line will be completed by Dec. 1, 1915. The vessels are being built by the Maryland Steel Co., at Sparrows Point, Md. The first is *FLORIDAN*, a freighter of 4,000 net tons, 414 feet long, 53-foot beam, and 31-foot depth of hold. The next, *ARTISAN*, will be ready on March 1, 1916, and *ARBOREAN* on May 1, 1916. These steamers will be added to the fleet of the American-Hawaiian line operating from the Atlantic to the Pacific coast via the Panama canal.

Augment South American Trade

W. R. Grace & Co. have added steamers to their rapidly increasing South American schedule until they now have eight vessels in the southern trade, plying as far south as Talcahuano, below Valparaiso, Chile. These are *CUZCO*, *COLUMBIA*, *WM. CHATHAM*, *GEO. W. FENWICK*, *AZTEC*, *ST. HELENS*, *TRICOLOR* and *EDGAR H. VANCE*.

The West Coast Navigation Co. will place three vessels in its new service between Philadelphia and Seattle, Wash., and will make the latter city the terminus of a new line of steamers, instead of Portland, Ore., as first announced. The vessels will call at Los Angeles, San Francisco, Portland and Seattle. The steamers *EDISON LIGHT* and *WILLIAM D. NOYES* are on their way to the Pacific coast. The new steamer to be added is *GEORGE HAWLEY*.

The new line will have a sailing every 30 days. A semi-monthly steamship line

A new semi-monthly steamship line has been established by the Independent Steamship Co., between Puget sound and southeastern and southwestern ports of Alaska. It has pier A in Seattle as headquarters, and handles both freight and passengers.

Plan Franco-Russian Line

Through the efforts of the Russo-French chamber of commerce, the project of establishing a regular steamship line between France and Russia via the Baltic sea is taking a definite shape and it may be expected that such a line will be established soon after the end of the war. The chamber has arranged for the regular transportation of cargoes between France and Russia through Scandinavian countries. In a short time the steamers of a French company, the Alliance Maritime, will begin regular trips between French ports and Narvik, Norway. As soon as circumstances permit, the company will extend the trips to Archangel.

Organizes New Company

The New England & Pacific Steamship Co., Bridgeport, Conn., a \$2,000,000 corporation, was recently organized to operate a freight line between the two American coasts via the Panama canal. Alexander McNab, Bridgeport, is at the head of the new company, which plans to begin business with four freighters of 4,000 to 5,000 tons, and expects to have six or seven in operation by the end of one year. It intends later to engage in the passenger business between Connecticut and Pacific ports. Bridgeport will be the home of the corporation and a port of call for its steamships, but New Haven is to be its principal port.

Mr. McNab is a former officer in the British navy and is an inventor and manufacturer of marine specialties. He has been for some time in consultation with the state commission which is constructing the deep sea terminal at New London, provided for by an appropriation of \$1,000,000. Arrangements, it is said, have been completed for the company to use this facility as soon as it is completed.

The Marine Transport Service Corporation, 17 Battery place, New York, will shortly begin the operation of three separate lines of freight steamers out of that city. One line is to run through the Panama canal to Los Angeles, San Francisco, Portland, Tacoma and Seattle. The second is to operate to South American ports. The third line will run to miscellaneous foreign ports wherever

business offers. It is understood that two steamers have been secured, and that negotiations are now being conducted for four additional steamers.

Takes Over Controlling Interest

Controlling interest in the Seeberg Steamship Co., Inc., New York, has been acquired by a Chicago firm. The name of the company has been changed to the Caribbean & Southern Steamship Co., Inc. This company is operating regularly from the Gulf of Mexico to West Indian and Central American ports, with chartered steamers. A direct service has also been inaugurated between New York and Archangel, Russia, which will be taken by chartered steamers sailing from New York. Several vessels have been secured for the service. The first sailing on this schedule was that of the steamer *SKARD*, from New York for Archangel, July 12. The second sailing was on July 25, and the third on Aug. 10. This service will continue as long as war freight business to Russia justifies it.

A. E. Clegg is manager of the new line's New York office. The company has also established a New York-Goteborg direct service, the first steamer sailing Aug. 15. She will be followed by others at intervals of one month. All vessels operated by this company are chartered. The building of new steamers in American ship yards, to be operated under the Norwegian flag, is now being considered by the company.

Uncertain Conditions on Pacific Coast

The steamship business in the Pacific northwest is at present passing through a state of uncertainty, say well-informed marine men. Although blessed by high rates and a plenty of tonnage to fill the ships available, it is harassed by an uncertainty of longshore conditions, the caprices of shippers, the lack of dead-weight cargo, the trouble with the Gaillard cut at the Panama canal, and the rapid shifting of the lines of trade caused by the canal. Trade routes, owing to the European war, have not been developed as they should have been.

A captain, one of the business-like type one meets on the new coasters developed by the opening of the canal, gave an interesting outline of the steamship business prospect as it looks to him and to other Americans interested in the development of the country's merchant marine, before a number of Portland, Ore., shippers and steamship men recently. Said this captain, in the course of his talk: "To the average man the conditions today appear ideal. Freights are high-

er than they have been since the Russo-Japanese war. You hear the cry that there is a marked shortage of steamers to carry the goods offered. The opening of the Panama canal has cut the distances between points in half. But the complications that have arisen in the past few months are surprising.

"In the first place, the Pacific coast has ceased 90 per cent of its dead-weight cargo offerings. The stopping of lumber shipments with the stagnation of that industry, the lack of heavy machinery, and the falling off in westbound steel products, have reduced cargo of this class at least 90 per cent. I know of one steamer that

left New York recently with only 4,000 tons of actual weight in cargo, yet she was filled to the hatches. It costs money to handle this sort of freight, and there is a corresponding increase in damage claims, stevedore charges and the like, while revenue is reduced. Then, too, while you have not heard much of it, we have had trouble at the Panama canal. There have been frequent little delays which have all meant money.

"The agitation for equitable rates to all Pacific coast ports has reached the east. Men who have money in steamship lines pay strict attention to this phase, and they fear that there may be trouble as direct result of it.

Strangest of all is the stand recently taken by the big shippers. An effort has been made to force down the rates of the coastwise lines. These lines have offered reductions of from \$60 to \$150 a car on freights. They are keeping big fleets of steamers on runs, paying them an average of \$15 a ton, whereas by putting them into tramp service they could secure from \$20 to \$40 a ton, and with smaller crews and less expense.

"Then there is the great psychological hold which the war has on all business, also the newness of the Panama canal routing to be overcome, all of which is making the steamship game rather uncertain just at present."

Ocean Grain Charter Market is Firmer

WITH coal and grain leading the way, chartering has become more extensive during the past two weeks and some moderate increases in rates have been established. This improvement follows a rather quiet and spotted July freight market, in which the general inclination had been toward lower figures. Generally shippers now appear to be more willing to pay higher rates for forward fixtures and the market affords signs of further advance.

Many Coal Cargoes Placed

Coal has furnished the largest demand in the past month. To the River Plate, the rates paid have ranged from 34 shillings to 34 shillings 6 pence (\$8.09 to \$8.21). To Rio Grande do Sul 42 shillings 6 pence (\$10.11) has been paid and to West Italy the rate has been from 36 shillings to 37 shillings (\$8.57 to \$8.80) for single trips to around 41 shillings (\$9.76) for four, five and six trips. The demand for West Italy now has subsided somewhat and charterers are offering 38 shillings to 39 shillings (\$9.04 to \$9.28) for last half of August and September loading.

Grain Rates Steady

In grain much of the fixtures have been for Gulf loading to West Italy for the last half of August at 10 shillings 6 pence to 11 shillings (\$2.50 to \$2.62). From the Atlantic range to West Italy, for last half of August, several steamers have been fixed at 9 shillings 9 pence to 10 shillings (\$2.32 to \$2.38).

From the Gulf of Mexico to Spain and Marseilles 10 shillings 6 pence (\$2.50) was paid, and to Piraeus, 11 shillings (\$2.62). A small steamer secured 11 shillings 6 pence

(\$2.85) from the Gulf to Spain or Marseilles with the option to West Italy at 11 shillings 9 pence (\$2.80), for September and October loading. There was some decline in lumber rates early in the month, but a recovery occurred later and from New Brunswick points to United Kingdom 140 shillings (\$33.32) was paid and to London and Liverpool 142 shillings 6 pence (\$33.91). Fixtures have been made at 240 shillings (\$57.12) from the Gulf to London and at 250 shillings (\$59.50) to the River Plate. A rate of 212 shillings 6 pence (\$50.46) was paid from the Gulf to United Kingdom on a cargo of timber and ties.

Cotton Tonnage Looking Up

Cotton tonnage is looking up and South Atlantic charterers are offering 110 shillings (\$26.18). An increase in this rate is expected, as a British steamer obtained 167 shillings 7 pence (\$23.19) from Galveston to Havre. On case oil, 50 cents was paid from New York to the River Plate.

Over 50 cents is reported to have been paid for Chinese ports. Time chartering has been slightly more active. For transatlantic voyages rates paid have been 12 shillings (\$2.86) for 12 months, 13 shillings 9 pence to 14 shillings (\$3.27 to \$3.33) for six to eight months and 15 shillings 6 pence (\$3.69) for round trips. To the West Indies, round trips are 10 shillings to 11 shillings (\$2.38 to \$2.62) and to the River Plate 15 shillings (\$3.57) for a down-trip.

Lake Tonnage Exceeds Demand

Tonnage on the Great Lakes during the past few weeks has considerably exceeded the demand. Shipping of

grain has been late and light. Iron ore has been handled in normal quantities, but congestion at the docks has handicapped coal transport materially. A number of vessels have been withdrawn from service on account of the scarcity of cargo business.

English Firm Profits

The annual report of Furness, Withy & Co., Ltd., one of the largest and most important of English shipping interests, operating steamers or booking freight to almost every port in the world, covering the 12 months ending April 30, 1915, shows that while the gross profits were about \$200,000 more than they were in the preceding year, compared with the operating results of two years ago, the company is approximately \$500,000 behind. The directors, however, consider the results satisfactory, as they have been enabled to charge no less than \$1,750,000, equal to about 9 per cent of the current book value of the assets, to depreciation, and to declare the usual dividend of 10 per cent.

It is declared that present high freight rates have probably more than compensated the company for any loss incurred through the war, the report disclosing trading profits of over \$2,094,000 as against \$1,875,000 in the previous year. Dividends were \$1,243,820.

The report further announced that the directors have set aside the sum of \$75,000 for the creation of a superannuation fund, \$50,000 being appropriated for distribution as a "war bonus" for masters, officers and engineers of the company's fleet. A large number of the steamers owned by the company are run by subsidiary companies.

Japanese Line Prospers

The Nippon Yusen Kaisha Steamship Co. of Japan shows profits for the six months ending March 31, 1915, of \$2,614,640. Deducting \$1,420,504 for depreciation, insurance and repairs, and bringing forward \$412,298 from the previous six-month period, the company had on March 31 a balance of \$1,606,434. This organization operates 92 steam vessels.

From the surplus, \$59,706 was added to the reserve fund, \$100,000 to the fund for extensions and improvements of service, \$250,000 to the reserve fund for construction and repair of buildings, and \$150,000 to the special reserve fund, while \$550,000 was absorbed by a dividend recommended by the directors, at the rate of 10 per cent a year. After deducting the appropriations and the dividend, the company had a balance of \$441,728 to carry forward into the present half year.

The Nippon Yusen Kaisha owns 91 of the steamships operating under its flag and has one under charter. The gross tonnage of its steamship fleet aggregates 416,788 tons. It also owns 38 tugs and steam launches, an aggregate of 1,220 gross tons. The chartered steamship has a gross tonnage of 3,755. Three new vessels, each of 7,300 gross tons, are under construction for the company.

No Receiver

A New York court recently denied a motion to appoint a receiver for the New York Transatlantic Steamship Co., which owns the steamship *MARACAS*, seized by the British government. The denial, however, will not prevent application for a receiver, should any new situation develop in the case. The court also ordered the treasurer of the company to request a firm of solicitors in London to cable as soon as an award is made by the British courts or government, of the claim for damages in the case of *MARACAS*. It was further ordered that the treasurer, on the receipt of this cable, should immediately give notice to the creditors and attorneys of the line, so that application for a receiver may be heard. The officers and directors of the company are, in the meantime, restrained from making payments, here or abroad.

Insurance Cut

Reductions in transatlantic war risk insurance schedules on shipments out of New York in merchant vessels of belligerent nations, were recently made. Rates per \$100 of insurance on shipments to London, England, have been lowered from $1\frac{1}{4}$ per cent to $1\frac{1}{8}$ per

cent, those to Havre from $1\frac{1}{4}$ per cent to $1\frac{1}{8}$ per cent, and those to the orient via Great Britain from $1\frac{1}{4}$ per cent to $1\frac{1}{2}$ per cent. The 1 per cent rate to Liverpool remains unchanged.

Underwriters have begun what promises to be a general reduction of rates covering special war hazards, such as capture, seizure, or detention by the British navy, of shipments to Dutch ports. For some time, New York underwriters have been charging $1\frac{1}{4}$ per cent to guarantee the shipper against

such contingencies. This rate has now been reduced to $1\frac{1}{8}$ per cent. To offset this, there has been an advance from $1\frac{1}{4}$ to $1\frac{1}{2}$ per cent in the special war hazard rate on shipments en route to Denmark, Norway and Sweden. The special hazard or seizure, detention or capture rate of 3 per cent which has been in effect on shipments en route to Stockholm itself is still being enforced. The similar charge for shipments en route to Greece remains unchanged at $\frac{3}{8}$ per cent.

Regrets Nebraskan Affair

German Government States That Torpedoing of American Merchantman by Kaiser's Submarine Was Unfortunate Accident

REGRETS, explanations and a frank admission of liability for damages, on the part of the German government, have followed the torpedoing of *NEBRASKAN*, an American liner, by a German submarine, on May 15. The case of *NEBRASKAN* was fully discussed in the July issue of *The Marine Review*. The commander of the attacking submarine, however, was exonerated by his government, which declared the torpedoing "an unfortunate accident". The Imperial foreign office's recent memorandum to the United States state department was as follows.

"The German government received from newspaper reports the intelligence that the American steamer *NEBRASKAN* had been damaged by a mine or torpedo on the southwest coast of Ireland. It therefore started a thorough investigation of the case without delay, and from the result of the investigation it has become convinced that the damage to *NEBRASKAN*, was caused by an attack by a submarine.

"On the evening of May 25 last, the submarine met a steamer bound westward without a flag and no neutral markings on her freeboard, about 65 nautical miles west of Fastnet rock. No appliance of any kind for the illumination of the flag or markings was to be seen. In the twilight, which had already set in, the name of the steamer was not visible from the submarine. Since the commander of the submarine was obliged to assume from his wide experience in the area of maritime war that only English steamers, and no neutral steamers, traversed the war area without flag and markings, he attacked the vessel with a torpedo, in the conviction that he had an enemy vessel before him. Some time after the shot the commander saw that the vessel had in the meantime hoisted the

American flag. As a consequence, he, of course, refrained from any further attack. Since the vessel remained afloat, he had no occasion to concern himself further with the boats which had been launched.

"It results from this that without a doubt that attack on the steamer *NEBRASKAN* was not meant for the American flag, nor is it traceable to any fault on the part of the commander of the German submarine, but is to be considered an unfortunate accident. The German government expresses its regret at the occurrence to the government of the United States of America and declares its readiness to make compensation for the damage thereby sustained by American citizens."

It is interesting to note that the German admission confirms the conclusions reached by Lieutenant John H. Towers, naval attache of the American embassy in London, who forwarded fragments of metal found in *NEBRASKAN* when she arrived at Liverpool, to Washington, together with an opinion that the vessel was torpedoed and not mined. In the case of *GULFLIGHT*, as well, the naval constructors at the American embassy at London were able to establish that the vessel was torpedoed.

Must Determine Nationality

The case of *NEBRASKAN*, it is said, proves conclusively that a merchantman must be "visited" in order to determine her nationality and the character of her cargo before being attacked. Some officials at Washington do not believe the United States would insist that in exercising the right of visit the submarine commander actually be required to board a merchantman, but would hold that a ship could be "visited" by signaling a warning to stop and asking for the

September, 1915

submission of papers to the submarine commander by the vessel's master. Germany's frank avowal of responsibility for the attack on NEBRASKAN has undoubtedly done much to relieve the tension it caused for some time, but the failure of Teutonic authorities, in the case of either GULFLIGHT, FRYE or NEBRASKAN, to disapprove of the acts of their submarine commanders has caused considerable comment.

Japs Get Space

The Japanese government has issued an order reserving for Japanese shippers all space on vessels operated by Japanese subsidized trans-Pacific lines. The pressure of munition shipments has already tended to create a congestion of freight in the far east, and the Japanese government desires to aid its own subjects. The hardship this ruling will impose on American exporters is indicated by the fact that during the first four months of the present year, \$13,856,000 of American exports were carried in Japanese bottoms, as compared with \$8,127,000 in the first four months of 1914.

Route Changed

Increased traffic from Detroit and cities in the vicinity of Michigan's metropolis has caused the Northern Navigation Co. to change its southern terminal from Sarnia, Ont., to Detroit, and the steamers NORONIC, HURONIC and HAMONIC now start on their weekly cruises to Lake Superior points from that city.

The steamers will also stop at Windsor and will leave Sarnia on the northern trip at the same time that the boats formerly started on the cruises from that port. As a result of the change in terminal, the cruises are lengthened one day.

In making the announcement of the change, H. H. Gildersleeve, general manager of the Northern Navigation Co., said: "Many years ago, when the Northern Navigation Co. began to carry passengers to the ports in Lake Superior, we depended almost entirely on Canada for our passengers. But year after year the traffic from Detroit and other cities in Michigan and nearby states increased, and it only became a question of time when we would be compelled to make Detroit our southern terminal to better satisfy our patrons and keep our services up to the high standard on which we insist."

Shippers Save Gasoline

By J. L. Graff

The transportation of automobiles across Lake Michigan from Chicago to several Michigan ports, has become a

considerable factor in the summer carrying business. Many owners of motor cars dread the sandy roads around the head of Lake Michigan and prefer to pay freight on their machines. Steamers sell round trip tickets for automobiles just as they do for passengers. The round trip costs about \$10, while a one-way ticket sells for \$7.50.

Last year the Graham & Morton Transportation Co., Chicago, inaugurated a new system of handling cars across Lake Michigan. At many eastern points, gasoline in the tanks of the cars is thrown away when they are taken aboard, to comply with government regulations concerning explosives on ship-board. The Graham & Morton company has installed power pumps and reservoirs at each end of its line. When a car is received for shipment, the contents of its tank are pumped into a reservoir. The shipper is given a ticket calling for the same quantity of gasoline at the point of debarkation, supplies being maintained at either end of the route. This, it is said, has proved a successful solution of the problem.

Charter Japanese Liner

The shipping firm of Frank Waterhouse & Co. have closed a charter with the Japanese steamer GISHUN MARU for a period of 12 months at 10 shillings 3 pence or \$2.50 per dead weight ton per

month. Delivery will be made at Moji, Japan, in August. The vessel will ply in the Puget Sound trade between the Pacific coast and ports in the Orient. The charter of the GISHUN MARU is of special interest as the vessel is taken at a record-breaking charter rate.

A New Ship Yard

Another large merchant ship building yard for the Atlantic coast is assured by a transaction closed last month, whereby a syndicate of New York ship-ping men, represented by Charles P. M. Jack, consulting engineer, 17 Battery place, New York City, has acquired the ship building half of the old Roach ship yard at Chester, Pa. The parties interested in this enterprise have not been made public. The Roach yard has been inoperative for several years. It has a frontage of 700 feet on the Delaware river and the ways are of sufficient size and in such a condition, it is said, to permit, with limited repairs, the construction of the largest sizes of merchant boats within a few months. In the days of its activity, this yard built numerous large vessels. Mr. Jack states to *The Marine Review* that the work of remodeling and renovating the property will begin without delay and that the company soon will be bidding upon the large amount of new tonnage now demanded.

Six Big Boats Ordered

FORTY-NINE freight and passenger vessels of good size are now under contract with ship yards along the Atlantic coast, the month of July having added six additional boats to the constantly growing list.

The Standard Oil Co. continues to be the largest buyer and it is credited with having placed four more tank boats in the past month. Two of these went to the Newport News Ship Building & Dry Dock Co. and two to the Harlan & Hollingsworth Corporation. The Newport News yard now is building five tankers for the Standard Oil Co. The New York Ship Building Co. has a second tanker for the Petroleum Transport Co. The Harlan & Hollingsworth Corporation also has taken a passenger boat for the Wilson line plying between Philadelphia and Wilmington. This vessel will be 192 feet long, 22-foot beam and 11.8-foot draught.

It is understood that the last four Standard Oil boats are to be delivered in about 20 months. This fact eloquently points to the congested condition of the eastern yards and the situation instead of improving is be-

coming worse. In many cases the inability to obtain deliveries before many months is causing prospective buyers to hold off. It is conservatively stated that at least a score of new vessels are under negotiation at the present time. As the logical accompaniment of this great demand, the builders are quoting much higher prices for work and the lean profits which were common to eastern yards in recent years, have long since vanished. The profits on contracts now being taken, it is said, will be considerable.

In view of the tied-up condition of capacity, plans continue to be shaped for the enlargement of present and the re-opening of some old yards which have been idle for several years. One proposition of this kind now being advanced is the rehabilitation of the old Roach ship yard at Chester, Pa., recently bought by a group of New York capitalists represented by Charles P. M. Jack, of New York, consulting engineer. Contracts have been let for again placing this plant in shape to accept contracts for large vessels.

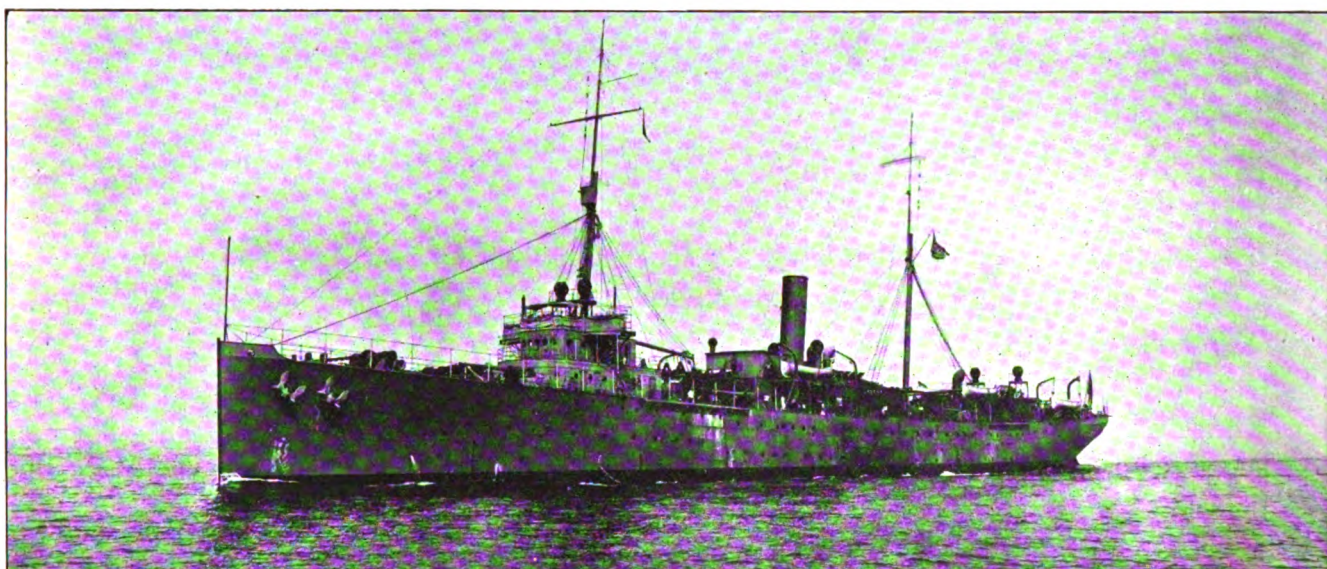
Photographs From Far and Near

Contributions for These Pages Are Solicited



MATOA'S VOYAGE ON THE INSTALLMENT PLAN

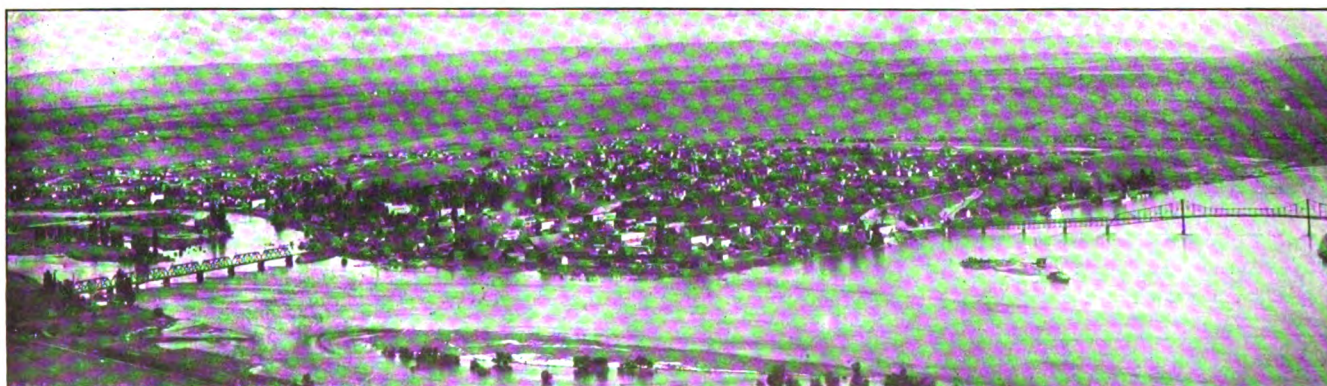
Mariners have always believed in the complete separation of quarterdeck and foc'sle, but seldom is it so literally carried out as in the case of this Great Lakes vessel, cut in two in order to pass the Welland canal on her way to new service on the Atlantic.



U. S. S. MELVILLE ON HER TRIAL TRIP

This fast vessel, recently completed by the New York Ship Building Co., Camden, N. J., is a tender for Uncle Sam's big torpedo boat squadron. Part of her complement of quick-firers is visible in the illustration.

Photo by New York Ship Building Co.



LEWISTON, IDA., THE ONLY SEAPORT IN THE ROCKY MOUNTAINS

The completion of the Dalles-Celilo canal has opened the Columbia river and its big tributary, the Snake river, to navigation as far as this thriving Idaho town, situated at the foot of the Craig range of the Rockies

Boston Photo News Co.

Latest Marine News in Pictures

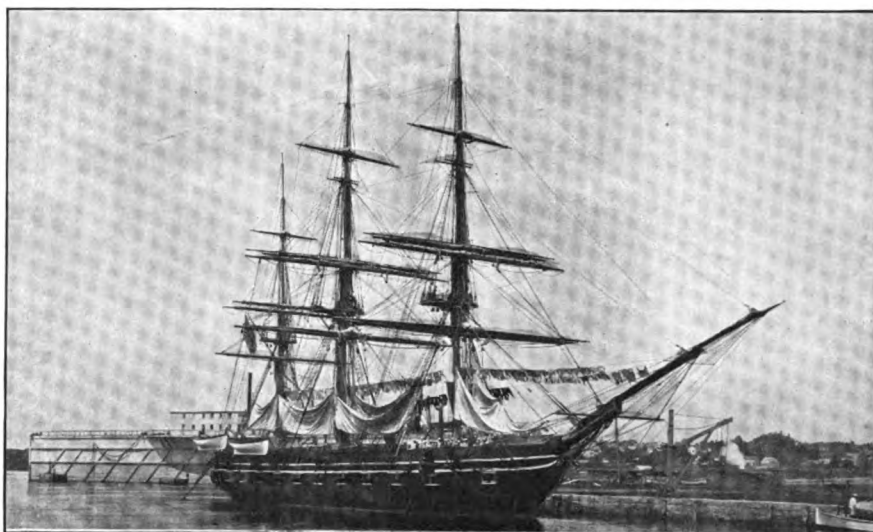
Payment Will Be Made For Acceptable Photographs



MILITANT CHRISTIANITY AFLOAT

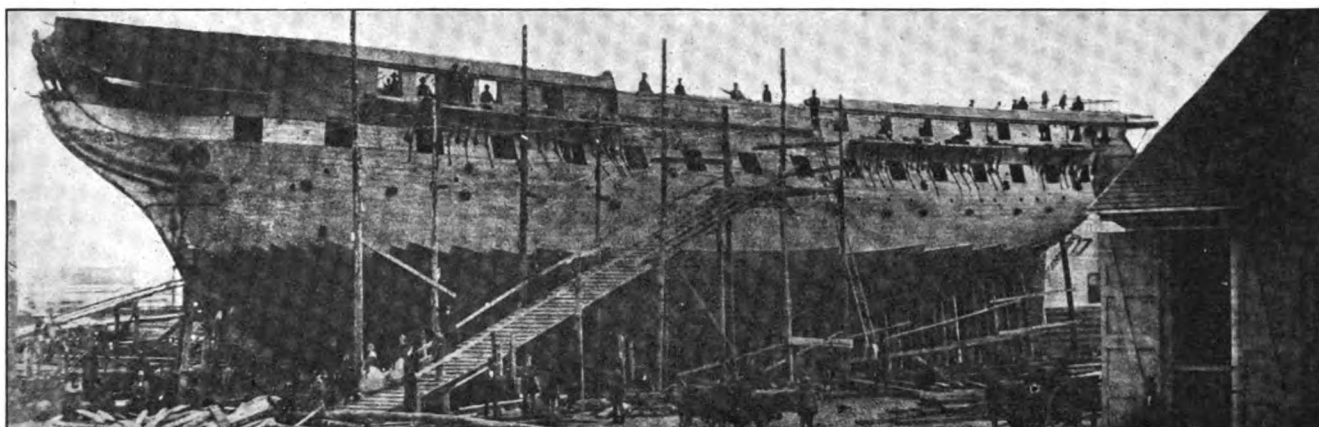
AMBERJACK, a sturdy auxiliary ketch manned by college students, which is now on her way to join Dr. Wilfred T. Grenfell's famous Labrador mission

Boston Photo News Co.



ANOTHER OLD SEA-FIGHTER PASSES

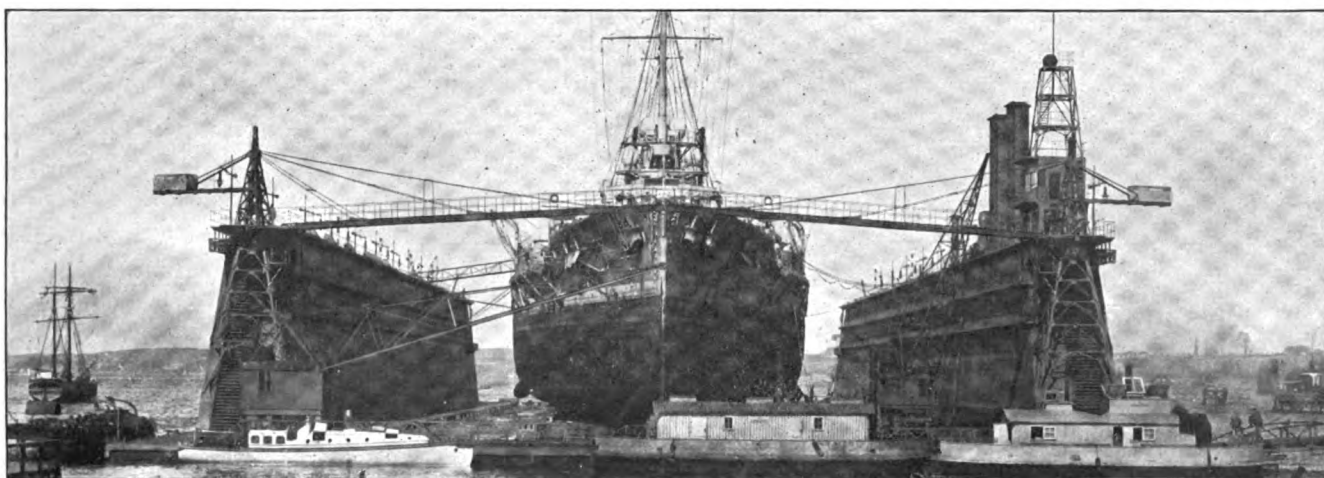
The veteran sloop of war PORTSMOUTH is now on her way to the scrap-heap "for want of an Oliver Wendell Holmes". She has actually participated in more fighting than "Old Ironsides". The illustration shows her lying at the Portsmouth, N. H., navy yard, not far from the place where she was built in 1843



"OLD IRONSIDES" AS SHE LOOKED 57 YEARS AGO

This photograph, taken May 27, 1858, shows CONSTITUTION ready for re-launching after repairs at the Portsmouth, N. H., navy yard.

By Permission of George W. Hall.



HOW GERMAN WARSHIPS ARE KEPT IN FIGHTING TRIM

This illustration of a big floating dry dock in Kiel harbor, one of Germany's largest and most important naval bases, shows the battleship THUERINGEN being overhauled after a long season of cruising and fighting in the Baltic sea.

Late Decisions in Maritime Law

Legal Tips For Ship Owners and Officers

Specially Compiled for The Marine Review

By Harry Bowne Skillman

Attorney at Law

THE recent decision in the case of *GLADIATOR*, 223 *Federal Reporter* 381, holds that a vessel at fault for a collision, will not be allowed demurrage for the time lost by her in consequence of her attempt to save the injured vessel.

* * *

It was held in the case of *Schirm vs. the Dene Steam Shipping Co.*, 222 *Federal Reporter* 587, that it was not negligence to fail to equip a stationary iron ladder 16 inches wide, of 9 rungs placed 11 inches apart, and with a rake of from 1 foot to 2 feet 9 inches, with hand rails.

* * *

The owner of a barge sunk in a collision in a navigable stream is entitled to reimbursement for the necessary expense of raising it to determine whether it can be repaired advantageously or not, according to the decision in the case of *the Louisville & Cincinnati Packet Co. vs. the United Coal Co.*, 223 *Federal Reporter* 300.

* * *

The civil code of Louisiana, article 3237, giving a privilege to persons injured by any carelessness, neglect, or want of skill, in the direction or management of any vessel, was held, in the case of *the Tropical Fruit Steamship Co., Ltd., vs. Towle*, 222 *Federal Reporter* 867, not to apply to a seaman injured on board a vessel through the negligence of officers in charge thereof.

* * *

A gangwayman employed by a stevedore to signal the winchman when to hoist bales of cotton and lower them into the hold of a ship, and an employee, whose duty it was to stow the cotton, were held, in the case of *the Gulf Transit Co. vs. Grande*, 222 *Federal Reporter* 817, to be fellow servants, so that the stevedore was not liable for injuries to the stower, caused by the gangwayman giving a signal prematurely to the winchman.

* * *

Silt and mud are a navigable part of a river, according to the case of steam dredge No 6, 222 *Federal Reporter* 576. The same case holds that the Harlem river is a public place within the laws of New York, giving the right to lay gas mains in public places, so that a main laid in such river, so as not to interfere with navigation, is a lawful structure. The same case further holds that a dredge is not liable for injuries to such a gas main, where neither the owner nor master knew of its presence nor had reasonable notice to insure watchfulness.

* * *

Salvors are bound to exercise reasonable care and such a degree of prudence and skill as persons in their condition ordinarily possess, and may fairly be expected to display. This rule was re-

cently restated in the case of *Dorington vs. City of Detroit*, 223 *Federal Reporter* 232, where the court further declared that the test to be applied is good faith and reasonable judgment and skill. Decisions were quoted to show that where a salvor is guilty of negligence there may be not only a forfeiture of all right of salvage, but also an affirmative award of damages against the salving vessel.

* * *

Congress having not as yet legislated in regard to injuries to employees occurring in interstate commerce by water, it was decided by the Connecticut supreme court of errors, in the case of *Kenneron vs. Thames Towboat Co.*, 94 *Atlantic Reporter* 372, that a state therefore may do so, and that the Connecticut workmen's compensation act, providing that such act shall not affect the liability of employers engaged in interstate or foreign commerce, where the United States laws provide for compensation for death or injury, does not render the act inapplicable to the death outside the state of persons employed in Connecticut, whose contracts of employment were to be performed on the navigable waters of Connecticut and other states and on the high seas.

* * *

The decision in the case of *Ralli vs. Societa Anonima Di Navigazione a Vapore G. L. Premuda*, 222 *Federal Reporter* 994, is authority for the statement that in the law of England, Germany and the United States, general average is payable by cargo, notwithstanding negligence of the ship, if the charter party or bill of lading contains a clause exempting from negligence. It was further decided that, where in a suit for collision in an English court, both vessels were found at fault, and each recovered half its actual damage from the other, one which had been in part reimbursed by general average contributions from the cargo, although protected from direct liability for its own half of such contributions by an exemption clause in its bill of lading, will not be permitted to retain the portion recovered from the other ship, but is liable to the cargo owners therefor.

* * *

District Judge Call, of the district court of the southern district of Florida, recently awarded \$4,000 for salvage service by a tug worth \$30,000 and having a crew of 10, to a ship worth \$300,000, which was in peril for about one and one-half days because of the danger of storms, the service, however, being rendered in calm weather. In this case, *Lucta*, 222 *Federal Reporter* 1015, Judge Call said: "Compensation for salvage service is more than a mere *quantum meruit*, and is allowed, in a sum that will not only recompense the parties engaged in the service, for the

time and labor expended, but also that others may be induced to risk property, life and limb, to save property and life from the dangers of the sea. While this is true, the amount awarded should not be excessive, and thus amount to a further imposition upon property already in distress, nor an inducement to persons to make exorbitant and unconscionable demands on the rescued property, nor in such an amount as to excite the cupidity of the rescuers or of others called on to render like services."

* * *

Statutes and authorities establish, according to the case of *TEASER*, 223 *Federal Reporter* 13, that when a steam vessel and a sailing vessel are approaching on such courses as to involve risk of collision, the duty devolves upon the steam vessel to keep out of the way of the sailing vessel, and this duty imposes not only the obligation to so navigate as to keep herself out of the way of the approaching sailing vessel, but, when she has a tow, the obligation of navigating with extreme care and with a high degree of diligence, to the end that she keep her fleet of barges out of the course on which the sailing vessel is approaching. Under such circumstances of approach, the sailing vessel should hold her course and keep her speed, except in situations of imminent peril or extreme danger. The same case holds that while those in charge of barges are held to rules of ordinary skill and watchfulness in management, it is understood that the higher measure of watchfulness and care rests upon the steam vessel which holds the barges in tow.

* * *

Late Marine Patents

Copies of any one of the following patents can be obtained by sending 15 cents in stamps to Siggers & Siggers, patent lawyers, suite 11, National Union building, Washington, D. C., if *The Marine Review* is mentioned.

- | No. | Description. |
|---------|--|
| 1142851 | Automatic combustion engine; James Shaw, Lodi, Cal. |
| 1142915 | Propeller; John L. Scott, Vermilion, O. |
| 1142916 | Propeller; John L. Scott, Vermilion, O. |
| 1142949 | Internal combustion engine; Thomas J. Fay, Brooklyn, N. Y., assignor to The Goby Engine Co., a Corporation of Ohio. |
| 1142986 | Collapsible lifeboat; George G. Schwabek, Baltimore, Md., assignor of one-third to William H. Zeigler, New Freedom, Pa. |
| 1143131 | Safety device for submarine or submersible boats; Edward Lasius Peacock, Wallsend-upon-Tyne, England. |
| 1143233 | Device for attacking submarines and the like; Louis Schramm Jr., Armer, Md. |
| 1143270 | Automatic ship's bell; Joel E. Hudson, Batavia, N. Y. |
| 1143408 | Internal combustion engine; Bernhard Kramer, Charlottenburg, Germany, assignor to General Electric Co., a Corporation of New York. |

Launch Self Unloader at Lorain

American Ship Building Co. Puts Big Boat in Water on
July 24—Will Carry Ten Thousand Tons of Limestone

THE launching of the steamer W. F. WHITE at the Lorain, O., yards of the American Ship Building Co., on July 24, attracted unusual attention among the marine interests of the Great Lakes. The vessel went into the water only 126 days after the contract for her construction had been let and in this period there were only 104½ working days. Considering the weight of material handled, the American Ship Building Co. broke all its previous records for speedy construction. In addition, the steamer is the largest of her type ever built and marks a decided advance in ship building.

W. F. WHITE is of the self unloading type and will operate in the limestone carrying trade between Rogers City, Mich., and lower lake ports. She is of 10,000 tons capacity, and her conveyor is designed to unload 1,700 tons an hour. She is 550 feet over all, 530 feet keel, 60 feet beam and 31 feet deep. Her cost is about \$500,000. She is owned by the Limestone Transportation Co. Final delivery will be made on Sept. 1, and it is expected that the vessel will leave Lorain for Rogers City on that date.

W. F. WHITE is the only large freighter building for the lake trade during 1915 and will be the only vessel of this class to go into commission this year as contracts let within the next few months would call for spring delivery. Several vessels, however, are being built at Great Lakes' ship yards for ocean service.

The wooden steamer HENNEPIN was the first vessel on the Great Lakes to be equipped with self unloading equipment, her carrying capacity being about 1,000 tons. She is still in commission. Altogether there are six vessels of this type now in operation, the others including HURON, CALCITE, ALPENA, WYANDOTTE and TOPEKA. HURON is the largest of the self unloading type in commission, having a capacity of about 6,500 tons.

Large Increase in Capacity

The success attained on the lakes by these self unloaders may be gaged by the rapid increase in the size of the steamers equipped with unloading machines. HENNEPIN has been thus equipped for only a few years but has only 10 per cent of the carrying capacity

of W. F. WHITE, the latest of this type. HURON, the largest self unloader in commission, can carry but 65 per cent of the cargo which W. F. WHITE will transport.

W. F. WHITE will have a triple expansion engine with 25½, 41 and 67-inch cylinders, and 42-inch stroke. Steam will be furnished at 185 pounds pressure by three Scotch boilers, 13½ feet in diameter and 11 feet long. The vessel will be unloaded by the conveying system. A 150-foot unloading boom permits the distribution of the cargo at a considerable distance from the ship. Robins conveyor belts will be used in the cargo hold. The cargo will be brought up from the hold by an elevating pan conveyor system. Two Westinghouse 350-horsepower engines will furnish power for the unloader. A complete description of W. F. WHITE will appear in an early issue of *The Marine Review*.

The launching was witnessed by more than 200 guests of the American Ship Building Co. The sponsor was Miss Margaret McManigal, New York, a niece of the president of the Limestone Transportation Co., in whose honor the



W. F. WHITE ON THE WAYS IMMEDIATELY PREVIOUS TO HER LAUNCHING

boat was named. The ship was christened with water brought from Rogers City, Mich. The launching was a complete success, the vessel sliding down the ways and into the water to the cheers of the guests and of the workmen who had broken the company's record for quick construction. The vessel was then towed out into the lake, turned around and brought back to the dock ready to receive her equipment.

After the launching, the members of the launching party were guests of the ship building company at a luncheon at the Hollenden hotel, Cleveland. Homer H. McKeehan, of Hoyt, Dustin, Kelley, McKeehan & Andrews, attorneys, Cleveland, presided as toastmaster. Among the speakers were Edward Smith, president of the American Ship Building Co., and W. F. White and Carl D. Bradley, of the Limestone Transportation Co. Mr. Smith gave a brief description of the vessel as well as an interesting account of the rapidity with which the contract had been executed. Mr. White and Mr. Bradley, after expressing their appreciation of the manner in which the ship building company had carried out its work, discussed the growth of the limestone carrying traffic on the Great Lakes. The company's deposits of limestone were estimated by the speakers to contain sufficient tonnage to keep a vessel of the capacity of W. F. WHITE, in commission for more than 2,000 years. The numerous uses of limestone were pointed out, including a wide range of applications from reinforced concrete to blast furnace flux.

Among the launching party were: Miss Margaret McManigal, Mr. and Mrs. W. F. White, Miss Mary White and Miss H. L. Baldwin, of New York; Mr. and Mrs. Carl D. Bradley, of Rogers City, Mich.; Captain W. J. MacLean, of Detroit; Mr. and Mrs. George T. Moody, of Detroit; Mr. and Mrs. B. H. Taylor and son, of Pittsburgh; Mr. and Mrs. Joseph R. Haynes, of Chicago; Mr. and Mrs. Brewster Loud, of Bay City; Mrs. J. L. Marsters, of Rogers City; Mr. and Mrs. C. K. Baldwin and R. W. Morgan, of

Chicago; Edward Smith, of Buffalo; Mr. and Mrs. George A. Marr, A. G. Smith, Mr. and Mrs. E. C. Collins, Mr. and Mrs. Authur Pomeroy, Mrs. F. H. Cummer, John T. Webster, Mr. and Mrs. Walter James, Mr. and Mrs. Walter Bowler, Fred Fuller, James Mills, Mr. and Mrs. A. G. Tane, Miss Dorothy Tane, Miss Margaret Ney, Mr. and Mrs. W. P. Hurst, Mrs. Martin, R. T. Sawyer, H. H. McKeehan, Miss McKeehan, Captain Tom Johnson, H. N. Herriman, John Smith, Chester Smith, Mr. and Mrs. James Workman, Mr. and Mrs. Mahlon Chew, Maynard Murch, N. J. Boylan, Mr. and Mrs. W. R. Woodford, A. T. Kinney, Lee Wallace and J. R. Davock, all of Cleveland.



IMMEDIATELY AFTER THE LAUNCH

The vessel will be brought out by Captain W. J. McLean, Detroit, who has had considerable experience in handling self unloading boats.

The new fuel ship Cuyama, authorized at the last session of Congress, has been contracted for by Secretary Daniels with the Mare Island navy yard, California, and will be a duplicate of the Kanawha and Maumee built there. The principal dimensions of the new vessel will be 455 by 56 by 35 feet 9½ inches and the mean trial displacement 14,500 tons. Speed 14 knots. The cargo capacity of the vessel is 7,554 tons of fuel oil and about 1,500 tons of bunker oil.

July Lake Levels

The United States Lake Survey reports the stages of the Great Lakes for the month of July, 1915, as follows:

Lakes.	Feet above mean sea level.
Superior	602.29
Michigan-Huron	579.92
Erie	572.08
Ontario	245.13

Lake Superior is 0.34 foot higher than last month, 0.39 foot lower than a year ago, 0.19 foot below the average stage of July of the last 10 years, 1.53 feet below the high stage of July, 1876, and 0.81 foot above the low stage of July, 1879. Average stages of the last 10 years indicate that the August level will be 0.2 foot higher. Lakes

Michigan and Huron are 0.14 foot higher than last month, 0.80 foot lower than a year ago, 1.12 feet below the average stage of July of the last 10 years, 3.66 feet below the high stage of July, 1876, and 0.02 foot above the low stage of July, 1896. Average stages of the last 10 years indicate that the August level will remain about stationary. Lake Erie is 0.22 foot higher than last month, 0.74 foot lower than a year ago, 0.76 foot below the average stage of July of the last 10 years, 2.33 feet below the high stage of July, 1876, and 0.62 foot above the low stage of July, 1895. Average stages of the last 10 years indicate that the August level will be 0.2 foot lower.

Lake Ontario is 0.01 foot higher than last month, 1.59 feet lower than a year ago, 1.83

feet below the average stage of July of the last 10 years, 3.59 feet below the high stage of July, 1862, and 0.54 foot above the low stage of July, 1895. Average stages of the last 10 years indicate that the August level will be 0.3 foot lower.

H. H. Raymond, formerly vice president and general manager of the Mallory and Clyde Steamship companies, has been made president of the two lines, succeeding Henry I. Mallory, who is retiring. Mr. Raymond, who remains as general manager, has been with the two lines for over 25 years. He entered the service as a purser.

New Type Diesel Attracts Interest

Yacht Southwark, First to be Driven by Southwark-Harris Crude Oil Engine,
Performs Creditably on Trial Trip—Details of Engine and Its Operation

By E. C. Kreutzberg

THE FIRST formal trial trip of the yacht *SOUTHWARK* on June 26, in the Delaware river, was of great interest to the marine field generally, since the craft is the first to be equipped with an engine of the new Southwark-Harris type. The performance of this prime mover, which operates on the diesel principle, indicates it has a wide range of usefulness for propelling vessels of various kinds and sizes.

SOUTHWARK, which is owned by C. P. Vaucelain, Philadelphia, is 98 feet long with 16-foot beam and 7-foot draft. Her propeller, which is driven at the rate of 300 revolutions per minute, is 50 inches in diameter and has a pitch of 56 inches. Her Southwark-Harris engine has four cylinders, the indicated horsepower being 240 and the brake horsepower, 150. The weight of the engine, including flywheels, is 24,000 pounds. During the cruise, the yacht easily maintained a speed of

12 miles per hour; it proved directly reversible from full speed ahead to full speed astern within five seconds, the engine in all cases starting and reversing under full load. The engine developed full power within 10 seconds of starting from stone cold. It operated on fuel oil costing $2\frac{1}{2}$ cents per gallon, the consumption being at the rate of $7\frac{1}{2}$ gallons per hour.

As is well known, a diesel type engine comprises certain essential parts, including a scavenging pump or low pressure compressor, a main or working cylinder and piston, an atomizer, a fuel pump and a multi-stage air compressor. In brief, an ordinary two-cycle diesel engine operates as follows: the fuel pump places a small quantity of crude or fuel oil in the atomizer at a certain instant in the revolution of the engine and leaves it

there. The scavenging pump blows the gases of combustion out of the cylinder and into the exhaust pipe, and leaves a charge of pure air in their place. The piston returns in the cylinder and compresses this charge of pure air to a pressure of approximately 500 pounds per square inch, at which pressure the air has a temperature of about 1,000 degrees Fahr., which is sufficient to ignite almost any kind of oil in atomized form. Next, the atomizer spindle is lifted by a cam shaft and the charge of

an enlarged extension of the main piston, working in its own cylinder below the working cylinder.

The normal function of the step piston is to draw in a charge of fresh air on each downward stroke and, on the upward stroke, deliver it to the adjacent working cylinder through a manifold. The cylinders, of course, are arranged in pairs, the step-piston of each scavenging the working cylinder of the other. In addition, the step-piston is employed for starting or reversing the engine on air.

On moving the starting lever, either ahead or astern, each scavenging cylinder immediately is converted into an air motor; the suction and delivery valves are cut out automatically, the air starting valves automatically open and compressed air enters the cylinder and operates the step piston. On continuing the movement of the starting lever, the atomizers supply fuel to the working cylinders, and thus the engine

begins operating on fuel. At this instant in the cycle of operations, therefore, the engine is being operated both by oil and by compressed air. It is customary, after starting, to operate the engine on fuel oil only, although, if desired, the power may be augmented by consuming both compressed air and oil at the same time. While operating as an air motor, the step piston, on its return strokes, continues to fulfill its function of a scavenging pump.

In ordinary diesel type engines, air at high pressure is admitted into the hot working cylinders for starting or reversing, this air being stored in bottles or tanks at a pressure of 800 to 1,000 pounds per square inch for two-cycle engines, or 300 to 800 pounds per square inch for four-cycle engines. Air, at these pressures, when expanded

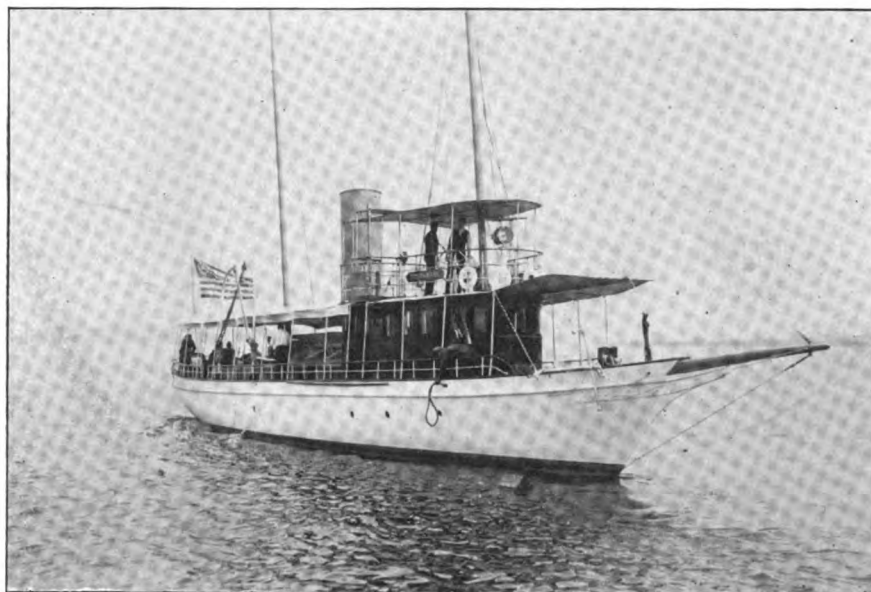


FIG. 1—YACHT *SOUTHWARK*, FIRST CRAFT TO BE EQUIPPED WITH A *SOUTHWARK HARRIS* ENGINE

oil, in the form of a spray, is forced from the atomizer into the hot compressed air. The oil immediately ignites, further heating the charge of air and causing it to expand behind the piston and thus to transmit power to the crank shaft.

Embodies Novel Features

These essential parts, and this sequence of operations, are found in the Southwark-Harris engine, which, however, embodies further features, novel in diesel engine design, which, it is claimed, simplify both the construction and operation, as well as increase the operating efficiency of the engine. The feature of chief interest is the scavenging pump, which, in addition to scavenging, performs other functions. This pump is of the step piston type, that is, the piston of the scavenging pump is

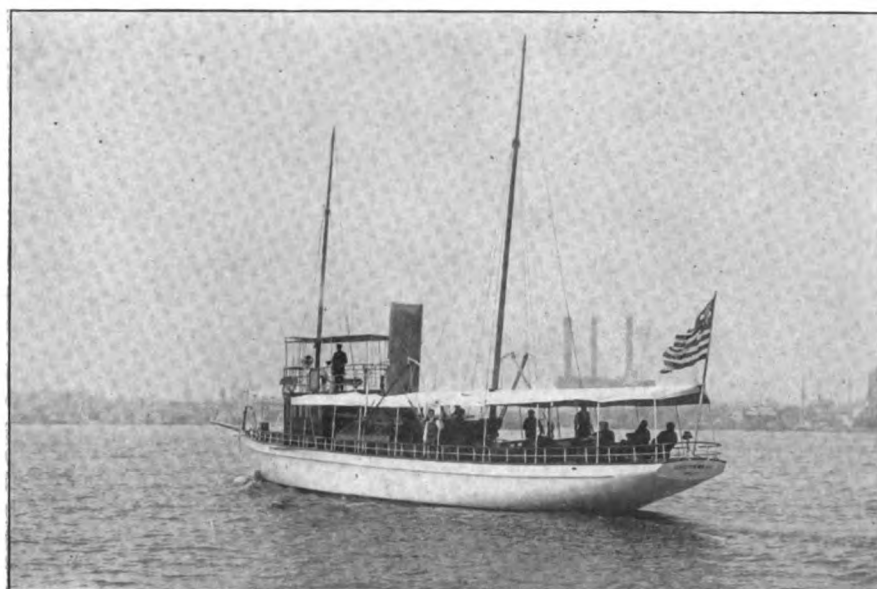


FIG. 2—STERN VIEW OF SOUTHWARK

through a valve, undergoes a drop in temperature to considerably below the freezing point and it is contended by some authorities that the entrance of this cold air may be the cause of cracked cylinders, cylinder heads and pistons.

Eliminates Drop in Temperature

In the Southwark-Harris engine, the necessity of admitting high pressure air into the working cylinders, with the corresponding lowering in temperature, just at the time when it is necessary to build up a temperature, is effectually eliminated by the use of the step pistons. Incidentally, each scavenging piston has a greater area than each of the main pistons, thus permitting the engine to be started under load, with air at 175 pounds pressure instead of at the usual pressure of 800 to 1,000 pounds.

Another feature made possible by the use of the step pistons is that while starting on air, the atomizer valves do not operate until the operator engages them and, consequently, the engine is provided with no by-pass valves.

Each cylinder is provided with only one cam which is employed for operating the atomizer. Scavenging air is admitted to the working cylinder through ports in its circumference and the exhaust gases pass through ports located opposite the scavenging ports; these ports are so placed that the piston opens and shuts them at the correct time during its stroke.

Acts as Crosshead

Each step piston, being subject to very little expansion and contraction, may fit rather snugly in its cylinder and thus acts as a guide and cross-head for the working piston, taking the side thrust of the connecting rod and keeping the wrist pin away from the hot working

piston. An additional advantage afforded by this engine is that the air drawn in by the scavenging pumps helps to cool the working pistons, the air itself thus being heated slightly at the same time. As a result, this scavenging air never enters the working cylinders cold.

The reversing of the engine is accomplished by moving one rod on each cylinder, which can be done by hand without the use of compressed air, the same wheel or lever which admits the starting air and the fuel oil, controlling these rods.

Speed Control Simple

The governor is of the centrifugal type, acting directly on the fuel pumps by varying the strokes of all the pumps at once. The speed of the engine may

be varied instantaneously, the governor all the time maintaining complete control. The governor may be set to any speed before starting the engine, and, when started, the engine will come to this pre-determined speed and remain there. This feature is of especial advantage in the case of a heavy head sea with the engine racing.

Has Wide Range of Usefulness

The Southwark-Harris engine was invented by Leonard B. Harris and is being manufactured by the Southwark Foundry & Machine Co., Philadelphia, which has been granted the United States license by the Harris Patents Co. The patent in this country is owned by the Harris company, Philadelphia, and patents already have been obtained in three countries and application has been made in eight more.

The engine, it is said, may be operated on any grade of fuel or crude oil having a gravity of 18 Baume or more, without preheating. It can be made in any size unit desired, being adapted for use on tugs, police, pilot, and fire boats, lightships, ice patrols, submarines and passenger and auxiliary vessels. It is claimed that a tug equipped with such an engine could be provided with capacity for holding oil sufficient to last for a year's operation. Economical operation would result, it is said, from the fact that an engine of this type could be gotten under full speed without any delay.

The engine is also made in small sizes for driving electric generator sets on large passenger vessels, battleships, etc., and may be used for supplying power for moving railroad cars, for stationary power plants and for general power and lighting purposes.

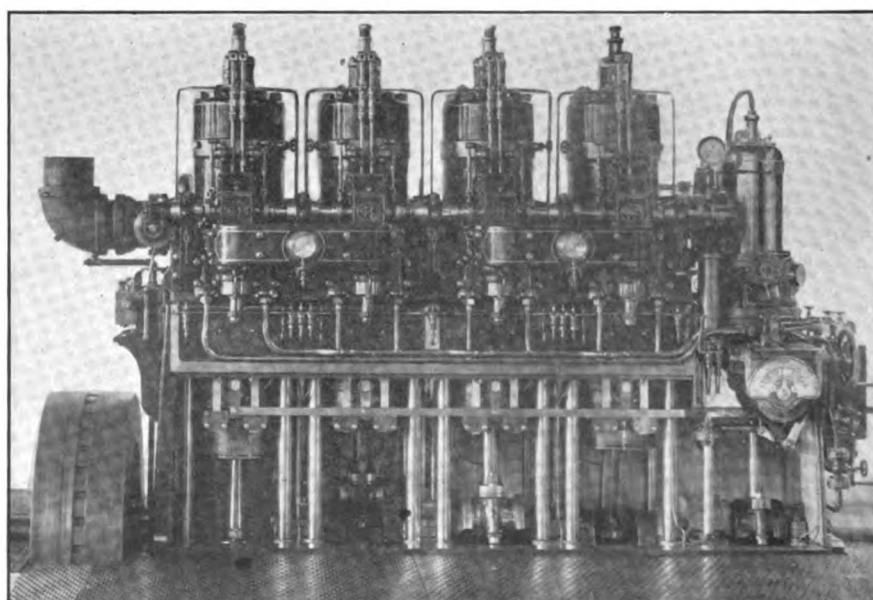


FIG. 3—SOUTHWARK-HARRIS DIESEL TYPE ENGINE, WITH SIDE PLATE REMOVED TO SHOW CRANK CASE INTERIOR

What the Government is Doing

Rulings of Bureau of Navigation

Custom House Regulations

Hints to Navigators

Coaling Facilities at Panama

SELF-LOADING 500-ton coal barges, equipped with endless chain conveyors, have materially lessened the difficulty of coaling vessels promptly at Cristobal, Panama canal zone. The permanent coaling plants at Cristobal are not yet completed, and before the recent installation of the two barges, whose conveyors were furnished by the Demayo company, the rapid increase in the number of vessels waiting to be coaled had begun to threaten a serious congestion.

Each of the loading barges now in use has two conveyors, consisting of endless chains of scoops, each operating in a vertical steel casing, about 25 feet high, from the top of which the material being handled is discharged into a pipe chute, passing by gravity to its destination. The elevators are suspended by cables from booms. This regulates their elevation while they dig into the coal, and allows of their being swung about to reach any point in the hold of the barge.

Equipment Proves Satisfactory

The first use of this new equipment on commercial vessels was in the coaling of the steamship *FINLAND*, of the Panama Pacific line, which recently passed through the canal on her way from New York to San Francisco. On the second vessel coaled, *GUATEMALA*, of the Pacific Steam Navigation Co., the rate of supply was $26\frac{1}{2}$ tons per hour. This is regarded as low for this equipment, and it is expected that when the operators become thoroughly trained to their work each barge will supply approximately 60 tons per hour. This will practically quadruple the facilities for bunkering at Cristobal.

In the meantime, work is being pushed on the permanent coaling plant for the Atlantic entrance as rapidly as the material is supplied by the contractors. It is planned to complete two of the four unloader towers this month, and, by a modification of their construction, to use them both for unloading colliers and loading into customer vessels from the stock pile. This is a temporary expedient, for use only until the reg-

ular re-loader towers shall be completed, but as the two towers command a considerable storage space and each will be capable of handling about 250 tons an hour, it will in all probability meet the situation quite satisfactorily until the completed plant is in service.

All four towers for the plant have been erected, but the two toward the outer end of the wharf are those on which early completion is being pushed. The two stocking and reclaiming bridges have been practically completed with respect to the structural work, but the machinery is yet to be installed. They will probably be completed by the end of this month. The material for the re-loader towers has begun to arrive from the United States and their erection will begin shortly. The viaduct commanding the dry storage space is about half completed. The dredging alongside the wharves has advanced sufficiently to allow vessels access to the plant whenever desired.

At the Pacific plant, one of the two unloader towers is practically erected, and all four of the berm cranes, which will be used for stocking and reclaiming, have been erected. Work has not begun on the two re-loaders, the wharf for which is yet to be built. The sinking of caissons for this wharf is in progress. This construction is intimately related to that of the dry dock, as the coaling plant will form one side of the entrance slip to the dry dock, and the work is held back somewhat by the needs of the dry dock construction. Connection of the unloader wharf with the re-loader wharf will require excavating through the cofferdam protecting the dry dock excavation, which adds to the difficulty of the work. The preponderance of bunkering at the Atlantic end is such, on account of the prices being \$1 less per ton there, that the present commercial demand for a coaling plant at the Pacific entrance is slight.

Boiler Water from Gatun Lake

Steamship masters were recently advised by the Panama canal authorities that, with the agreement of the pilot,

excellent boiler water may be taken up in Gatun lake, preferably between Gatun locks and Darien. South of Darien the water is likely to be muddied by the dredging operations in the cut or by high waters in the Chagres river. The pilot can advise of the best place to take water.

Southbound vessels of deep draft should confer with the pilot as to the advisability of taking water in Gatun lake, as an increase in draft may affect the facility of handling the vessel past the part of the channel affected by slides. Northbound vessels which have passed through the cut may take up all the water desired, without charge.

The water in Miraflores lake is slightly saline, as a result of infiltration from the Pacific ocean. At present the degree of salinity is not sufficient to be distinctly injurious but it is better to take the entirely fresh water of Gatun lake.

To Chart Winds on Canal Routes

In view of the increasing use of the Panama canal by sailing vessels, the marine superintendent of the canal has requested the United States hydrographic office to furnish information as to seasonal winds over various areas on six principal routes for sailing both ways, between the canal and the west, east and gulf coasts of the United States, west coast of South America, principal European ports, and trans-Pacific ports. This information will be published for the benefit of mariners. The use of the Panama canal involves a considerable shifting of routes for sailing vessels, and as some of the areas to be crossed have been little frequented heretofore by sailing ships, accurate directions are not at present available.

Captain Larsen, of the Norwegian barque *BIRTHA*, which recently passed through the Panama canal, declares it his belief that the canal will not save any considerable amount of time for sailing vessels. Captain Larsen asserts that about 126 days' voyage will be required from the Columbia river to Falmouth, Eng., via the canal. He says

that his vessel got through the calm belt very well, but that headwinds and currents delayed her passage to Panama bay. From Cape Mela and up to Balboa required three weeks' sailing, which distance, Captain Larsen believes, should be negotiated in 24 hours, with a fair wind.

Alter Breakwater

The extremity of the old west breakwater at Conneaut, O., is now being removed by United States government engineers, working in from the outer end. The present light is to be discontinued, the lighthouse being moved along the old breakwater about 650 feet. The fog bell and a temporary fixed red light are being maintained as near the outer end of the work as practicable, both being moved shoreward along the old breakwater as fast as the breakwater is removed. The United States engineers in charge of the work have warned all vessels to use caution in entering and departing while the work is in progress. If all vessels keep on range piers they will clear the obstructions.

No Shrapnel

The department of commerce recently informed the Hamburg-American line, New York, that loaded shrapnel shells, with or without fuses attached, or the fuses for same packed apart, may not be transported on steamers carrying passengers. The bureau has also informed the Goodrich Transit Co., Chicago, among other things, that muriatic acid or hydrochloric acid may be accepted for transportation under the same conditions as sulphuric acid. During the month of July, 1915, the following-named companies submitted affidavits in regard to the manufacture of valves and fittings, as required by the general rules and regulations: Geo. H. Waters Co., Mariners Harbor, N. Y.; Mitchell Co. (John McAinsh, proprietor), New York.

Traffic Lanes Proposed

The question of establishing well-defined navigation lanes and anchorage grounds in Nantucket and Vineyard sounds, Mass., which waters have probably the largest traffic of any similar maritime thoroughfare in the country, after much discussion has finally secured governmental hearing. With the increase of steamship traffic through these waters, the indiscriminate anchoring of vessels directly in the principal fairways has come to be a serious menace to public safety. A recent letter from the secretary of commerce to the secretary of war called attention to the fact that it lay within the latter's jurisdiction to establish and define anchor-

age grounds in navigable waters, and also suggested the urgent need for such action in the case of Nantucket and Vineyard sounds. The secretary of war accordingly requested the chief of engineers to secure the necessary data and prepare plans for suitable traffic routes and anchorages in the Massachusetts sounds. These plans have been submitted to several important Atlantic coast marine and commercial organizations, for suggestions as to modifications. A chart of the proposed fairway and mooring grounds is shown in the accompanying map, sketched in dotted lines.

Uncharted Rock

Reports having been received by the United States survey office from the Ashley & Dustin steamer line, Detroit, regarding an obstruction in Lake Erie off Carpenter point, Kelley's island, on the course from Ballast island to Marblehead, which has been struck at different times by the steamers PUT-N-BAY, CITY OF ERIE and ALABAMA, each drawing about 12 feet, an investigation of the locality by sweeping was recently made by the lake survey steamer SURVEYOR. This disclosed an uncharted



MAP OF PROPOSED TRAFFIC LANES

Two range lights on white masts surmounting platforms, were established last month at Mud Island, Delaware river. The front light, which flashes white for 0.3 second in every second, is of 30 candlepower, 13 feet above water, and is situated on a prolongation of the axis of the 200-foot channel dredged past the island. Its position is as follows: Latitude 40 degrees, 4 minutes, 5 seconds; longitude, 74 degrees, 56 minutes, 23 seconds.

The rear light, which flashes white for one second in every two seconds, is of 100 candlepower, 31 feet above water, and is about 445 yards and 55 degrees from the front light. Eddington light has been permanently discontinued by order of the government authorities.

rock, about 25 feet in size, with smooth sides and rounding top, having a least depth of 13.8 feet over it at the existing stage and 21 feet of water surrounding it. The rock is located about 2,600 feet west by north from Carpenter point, and about 500 feet northerly of a line from the American Eagle shoal striped spar buoy to the Kelly Island Lime & Transport Co.'s dock on the north side of Carpenter point. The position of the shoal is fixed by the following bearings and distances to prominent marks: Middle Island light, 31 degrees, 45 minutes (N. N. E. $\frac{7}{8}$ E.), 6 $\frac{3}{4}$ miles. Marblehead light, 160 degrees, 0.05 minutes (S. by E. $\frac{3}{4}$ E.), 5-1/16 miles. South Bass light, 288 degrees, 15 minutes (W. N. W. $\frac{3}{8}$ W.), 5 $\frac{1}{4}$ miles. Perry monument, 314 degrees, 25 minutes (N. W.), 4-13/16 miles. This rock is a menace to

vessels of medium or heavy draught, especially in a seaway, and its location has been reported to the lighthouse inspector, 10th district, Buffalo, with the recommendation that an appropriate buoy be established to mark it. A temporary buoy carrying colored flags was placed by SURVEYOR, about 50 feet southwest of the rock.

At the annual meeting of the William Cramp & Sons Ship & Engine Building Co., held on June 24, Andrew Fletcher was elected a director for the ensuing year.

Lake Erie Ore Receipts

Lake Erie ore receipts for July were 6,161,730 tons, an increase of 1,220,058 tons over June. The shipments by ports are as follows:

Port.	Gross tons.
Buffalo	803,789
Port Colborne	8,252
Erie	85,667
Conneaut	1,434,386
Ashtabula	1,371,531
Fairport	369,298
Cleveland	1,241,132
Lorain	603,880
Huron	110,013
Sandusky	106,602
Toledo	27,180
Detroit	6,161,730
Total	6,161,730

July Ore Shipments

Port.	July, 1914.	July, 1915.
Escanaba	664,721	813,870
Marquette	297,413	567,359
Ashland	533,744	708,285
Superior	1,956,911	1,286,402
Duluth	1,169,410	2,414,649
Two Harbors	1,162,315	1,413,456
1915 increase	5,784,514	7,204,021
		1,419,507
Port.	To Aug. 1, 1914.	To Aug. 1, 1915.
Escanaba	1,740,741	2,062,700
Marquette	681,361	1,114,360
Ashland	1,416,825	1,870,077
Ashland	5,690,413	3,064,002
Superior	2,949,286	6,710,460
Duluth	2,930,004	3,903,704
Two Harbors	15,408,630	18,725,303
1915 increase		3,316,673

Lake Superior Commerce

	To Aug. 1, 1914.	To Aug. 1, 1915.
Copper, net tons	30,087	16,788,171
Grain, bushels	30,118,693	3,068,037
Bldg. stone, net tons	3,795,812	18,097,758
Flour, barrels	14,739,927	11,575
Iron ore, net tons	11,575	221,590
Pig iron, net tons	221,590	38,626,478
Lumber, M. ft. B. M.	55,788,822	131,919
Wheat, bushels	131,070	12,475
Unclss. frgt., net tons	15,501	994,226
Passengers, number		4,781,615
	To Aug. 1, 1914.	To Aug. 1, 1915.
Coal, anthracite, net tons	1,133,532	100
Coal, bituminous, net tons	5,906,840	31,250
Flour, barrels	517	95,595
Grain, bushels	130,541	297,406
Mfld. iron, net tons	403,331	474,203
Iron ore, net tons	510,233	11,937
Salt, barrels	17,501	
Unclss. frgt., net tons		
Passengers, number		

SUMMARY OF TOTAL MOVEMENT

East bound, net tons	17,939,685	20,472,730
West bound, net tons	7,741,288	6,390,641
	25,680,973	26,863,371
Vessel passages	8,872	8,547
Registered tonnage, net	19,798,790	21,519,915

Vacancies in Inspection Service

The federal civil service commission has announced that open competitive examinations for local and assistant inspectors of hulls will be held Sept. 15 and 16. At the present time two vacancies of this kind exist, one in the position of local inspector of hulls, Galveston, Tex., salary \$1,500 per year; the other, in the position of assistant inspector of hulls, New Orleans, salary \$1,800 per year. Further details of the examinations may be secured from federal authorities.

May be a Menace

The lake survey steamer COL. J. L. LUSK recently made a careful investigation by sweeping over the wreck of the steamer CHAS. S. PRICE, 10½ miles northeast of Fort Gratiot light and 2¾ miles eastward of the Point Edward range line. The wreck lies approximately north and south, bot-

tom up, with about 40 feet of water over the north end and a least depth over the south end of 24.1 feet at the existing stage. The winter spar buoy of the lighthouse bureau remains in position, about 7,000 feet south of the wreck. As the wreck might be dangerous to large vessels during periods of low water and with a heavy sea running, mariners are advised to avoid this locality. The wreck is marked by a red and black horizontal striped gas buoy, which shows a red flash of 3 seconds, with eclipse of 7 seconds, moored in about 60 feet of water at its northerly end.

The United States lighthouse service will soon publish a revised edition of "Regulations for the Lighting of Bridges Over Navigable Waters", which has been approved by the secretary of commerce. A copy will be sent free to any shipmaster, pilot, or bridge owner on application to the division of publications, department of commerce, Washington, D. C.

Many Treaties Denounced

TWENTY-ONE governments were recently notified by the United States of its intention to terminate provisions of existing treaties with them, in conflict with the seaman's act passed by the last congress. Refusal of the nations interested to consent to this proceeding would result in destroying existing provisions for the settlement of estates, the transfer of property, the exercise of consular functions, diplomatic immunities, customs, port and lighthouse dues, and many other subjects which have formed the basis of treaty regulations and stipulations between civilized powers. It would then become necessary for the state department immediately to begin negotiations for new treaties to prevent the infliction of serious injury upon the business and diplomatic relations of the United States.

Objections were made to the seaman's act by Spain, Italy, Austro-Hungary, the Netherlands, Great Britain and other European governments. They objected especially to those provisions of the act which permit a foreign sailor in an American port to claim half his wages at pleasure. They also objected to the sections prohibiting the advance of wages to sailors, limiting allotments, requiring a majority of the crews of foreign vessels to be able to understand the language of the commissioned officers, prescribing the proportion of veteran sailors to man each lifeboat, and exempting foreign sailors from arrest for desertion. All of these provisions

were alleged to be in violation of existing treaties. A list of treaties and conventions affected by the seaman's act, showing the pertinent article and the sections of the act at variance with it, is as follows:

Country	Date	Article affected	Affected by section
Austria-Hungary	May 8, 1848	4	4, 16
Austria-Hungary	July 11, 1870	11	4
Austria-Hungary	July 11, 1870	12	16
Austria-Hungary	Mar. 9, 1880	11	4
Belgium	Mar. 9, 1880	12	16
Belgium	May 13, 1858	34	16
Bolivia	Dec. 12, 1828	31	16
Brazil	June 18, 1858	18	16
China	Dec. 12, 1846	33	16
Colombia	May 4, 1850	3	4, 16
Colombia	Jan. 24, 1891	5	4, 16
Congo	July 11, 1861	1	4
Denmark	July 11, 1861	2	16
Denmark	July 11, 1861	6	16
France	June 24, 1822	8	4
France	Feb. 23, 1853	13	4
France	Dec. 11, 1871	14	16
German Empire	Dec. 11, 1871		
Great Britain	June 3, 1892	*	16
Greece	Nov. 19, 1902	12	4
Greece	Nov. 19, 1902	13	16
Italy	Feb. 24, 1881	*	4
Italy	Feb. 24, 1881	9	4, 16
Mecklenburg-Schwerin	Dec. 9, 1847	3	16
Netherlands	Jan. 19, 1839	11	4
Netherlands	May 23, 1878	12	16
Netherlands	May 23, 1878	10	4
Netherlands	May 1, 1828	11	16
Prussia	May 1, 1828	11	4
Roumania	June 17, 1881	12	16
Roumania	June 17, 1881	23	4
Spain	July 3, 1902	24	16
Spain	July 3, 1902	13	4
Sweden and Norway	July 4, 1827	14	16
Sweden and Norway	July 4, 1827	11	4
Sweden	June 1, 1910	12	16
Sweden	June 1, 1910	10	16
Tonga	Oct. 21, 1886		

*Whole treaty affected.

Admit Right to American Registry

Government Officials Favor Putting Disputed Ships Under American Flag—Interesting Details of Proposed Transfer

ATTEMPTS to deny American registry to a fleet of 11 vessels owned by an American corporation, all of whose officers are American citizens, because German capital is interested in the project, recently proved futile. The ships were purchased in English, Scandinavian, and Mediterranean ports by a Dutch merchant and a Danish agent. It was alleged that the latter had previously been convicted of violating Danish neutrality in commerce with Germany, and that Hugo Stinnes, who is well known in shipping circles at Hamburg and Mulheim, Germany, supplied the funds for buying the ships. Their value is estimated at more than \$2,000,000.

The corporation which will operate the fleet is the American Transatlantic Co., incorporated under the laws of Delaware for \$250,000. Richard G. Wagner, an American citizen, is its president, members of his family holding the other offices. At the time of application for registry, only \$1,000 of the stock had been paid up.

Legal officials of the commerce department held that the fact that an American corporation, with American officers, owns a vessel entitles it to registry, no matter where the bulk of the stock of the corporation may be owned or where it secures its working funds.

The bureau of navigation, however, warned Wagner that if his vessels sought to engage in European trade, they probably would find their way to a prize court. Wagner said that some of the ships were to be used in the South American trade.

Acting Secretary Sweet, of the department of commerce, requested that the state department pass upon the probability of international complications following the registry of the ships, now under various neutral flags. Secretary Lansing thereupon decided that admission of the vessels to American registry would in no way affect American relations with belligerent countries. On this basis, Acting Secretary Sweet recommended to Secretary Redfield that registry be granted.

The steamers involved in the transaction were originally known by other names, but are now designated as GOTLAND, LAPLAND, GULLAND, VESTLAND, GRONLAND, NYLAND, VINLAND, FINLAND, DJURSLAND, CLEVELAND, SYDLAND, LAURA,

and an unnamed German tank steamer now building in a German ship yard. LAPLAND now flies the Norwegian flag, the others having been recently transferred to the Danish flag, with the exception of LAURA, which has been flying the Dutch flag.

There had been frequent allusions in the past few weeks to the change of ownership of these vessels, and their transfer to the American flag. One of the steamers, GOTLAND, was mentioned as having been reported sold to Americans. On the basis of this publication, Eugene T. Chamberlain, United States commissioner of navigation in the department of commerce, who has charge of the consideration of questions connected with the transfer of vessels under the new ship registry act, sent the following letter to the publisher of this report:

"The Danish steamship GOTLAND, until recently the Greek steamship LEONIDAS CAMBANIS, reported to have been sold to Americans (*Maritime Register*, June 9, 1915, page 29), is not entitled to American registry. Not one dollar of American money is invested in this ship or seven others recently purchased under similar conditions, and the bureau of war risk insurance and American consuls have been notified that these ships are not entitled to the American flag.

"Considerable capital early in the year was placed by Hugo Stinnes, the owner of a dozen German merchant steamers of Hamburg and Mulheim, at the disposal of Albert Jensen, a coal merchant of Copenhagen. Jensen made several purchases of ships in February and March, but since his imprisonment this spring by the Danish government for violation of Danish neutrality, the deal has been handled by one Theodore Lahr, of Rotterdam. Over \$1,000,000 is involved."

Department Alert

All applications for the transfer of foreign ships to American registry, especially vessels flying the flags of belligerent nations, have been very carefully scrutinized by the department of commerce recently, especially on account of the questions involved in the transfer of SACRAMENTO and DACIA to the American flag. The case of SACRAMENTO resulted in federal grand jury proceedings at San Francisco on account of the nature of her transfer. DACIA was captured by a French warship, which conveyed her to a French port.

What aroused official suspicion in connection with the attempt to transfer the so-called Danish ships to the American flag was the fact that none of the ves-

sels was to be found enumerated in the official Danish register of merchant ships or in Lloyd's. An investigation resulted in the discovery that they had been flying the Danish flags only a short time, that they had been recently purchased in most instances by Albert Jensen, and had borne other names while flying the flags of other nations than Denmark.

Further investigation is said to have shown that Jensen had been engaged in running contraband copper from Norway into Germany, that he had been imprisoned by the Danish government for violation of Danish neutrality, and that since his imprisonment the deal for the investment of the German capital furnished by Hugo Stinnes, had been handled by Theodore Lahr, of Rotterdam. Stinnes has headquarters at Mulheim, Germany. This is in the Rhenish district, near the great ammunition works of the Krupps at Essen. Investigation showed that Lahr, who had been picked out by Jensen to complete the deal, was connected with the Dutch ship-broking firm of Lenders & Co., at Rotterdam.

It appears that application for the American registration of these ships was not made direct to the government at Washington. The bills of sale have been signed abroad and efforts have been in progress to have the vessels transferred from Jensen's name to that of Richard Wagner and the American Transatlantic Co., of New York, by means of consular transfer of registration. GOTLAND, which was originally the Greek steamer CAMBANIS, was renamed GOTLAND by Jensen after she had been transferred to the Danish flag, and received a consular transfer to the American flag at Copenhagen. The bill of sale put the purchase price at 650,000 crowns, or about \$160,000. According to the papers, the new owner was the American Transatlantic Co. The transfer was effected through the American consul at Copenhagen. Another of these vessels transferred to American registry at Copenhagen was the Norwegian steamer RYGIA, which had been bought by Jensen, for Stinnes, and then transferred to the Danish flag and renamed GULLAND. GULLAND was renamed ALLEGUASH. This was selected as the name of an American river and on the theory that it would probably indicate that the vessel was of American ownership. The name ALLEGUASH was painted in tall, white letters on the side of the ship

after the application had been made to the American consul at Copenhagen for American registry.

In both cases—that of GOTLAND and that of GULLAND—the registry granted by the consul at Copenhagen was first rejected and disapproved by the department of commerce. This rejection was based on the inability of the department to discover that any American money had been invested in the vessels by the American Transatlantic Co., of New York. The consul at Copenhagen was instructed that the vessels were not entitled to American registry.

Another steamer that had been transferred to American registry was NYLAND. This registry was granted by the American consul at Christiania. She was originally a Norwegian vessel, named SOLVEIG. When bought by Jensen for Stinnes, her name was changed to NYLAND, and she was transferred to the Danish flag. Then she was represented as having been sold by Jensen to the American Transatlantic Co., but no American money was found to have been invested in the transaction, and the consular transfer of registry was rejected. An unnamed tank steamer, which was to fly the American flag and which has been under construction in Germany, was taken over in the name of Jensen, who sought to obtain consular registration under the American flag, but was rejected.

A Wilderness of Names

The vessels involved in the Jensen deal, for which American registry has been sought on the ground that they were being sold to the American Transatlantic Co., their original names, the subsequent names given to them by Jensen, and the American names it was proposed to assign to some of the vessels, as well as the latest reported location of the steamers, are given in the accompanying table:

An unnamed tank steamer, German flag, building in Germany.

The Greek steamer LEONIDAS CAMBANIS; Jensen's name GOTLAND after transfer to Danish flag; at Buenos Aires, May 20.

The Norwegian steamer HERO; Jensen's name LAPLAND after transfer to Norwegian flag; proposed American name KANKAKEE; left Barrow, England, April 17, for Copenhagen.

The Norwegian steamer RYGIA; Jensen's name GULLAND after transfer to Danish flag; proposed American name ALLEGUASH; left Malmö, May 16, for Stockholm.

The Norwegian steamer SANNA; Jensen's name VESTLAND after transfer to Danish flag. This steamer disappeared and was feared lost, whereupon the steamer SYDLAND was substituted in her place in the transaction.

The Swedish steamer VERA; Jensen's name SYDLAND. This steamer was substituted for VESTLAND, feared lost.

The Dutch steamer AMELAND; Jensen's name GRONLAND after transfer to Danish flag; reported at Montevideo May 15.

The Norwegian steamer SOLVEIG; Jensen's name NYLAND after transfer to Danish flag; reported at Marseilles May 3.

The Norwegian steamer RAGS; Jensen's name VINLAND after transfer to Danish flag; reported at Copenhagen Feb. 20.

The Greek steamer CONDYLIS; Jensen's name FINLAND after transfer to Danish flag; reported at Helsingborg May 28.

The Dutch steamer VEERHAVEN, Jensen's name DJURSLAND after transfer to

Danish flag; reported to have left Newport News May 22 for Norresundby.

The Greek steamer SPYROS VALLIANOS; Jensen's name CLEVELAND after transfer to another flag; proposed American name HOUSATONIC; reported at Rotterdam May 18.

The Dutch steamer LAURA; name not changed by Jensen or Lahri; proposed American name AUSABLE; sailed from Philadelphia May 26 for Rotterdam.

Wagner Recently Abroad

Richard Wagner, president of the American Transatlantic Co., visited Washington recently and conferred with federal officials in connection with the effort to bring the vessels under the American flag.

Wagner had been in Germany and met Albert Jensen, whom he is understood to have described as his cousin. Jensen, who was found on investigation to have been a coal merchant in Copenhagen, was represented as a large ship-owner.

When asked as to why Jensen wanted to dispose of these ships, Wagner said that he did not want to keep his fleet because he was afraid that Denmark was going to be dragged into the war. Investigation showed that some of the ships had been flying the Danish flag only a few days.

In his office on the 26th floor of the Whitehall building, when interviewed recently, Richard Wagner was reluctant to tell anything about the company of which he is president.

But he was emphatic in asserting that the charge that there was no American capital invested in the enterprise was baseless. He said that every dollar in it was American money. Mr. Wagner said he was the only person interested in the company who had a German name, and that he was born in this country, although his father was German.

"We incorporated the American Transatlantic Co. in Delaware last March with a capitalization of \$2,000,000," he said. "All of the capital is subscribed for already, and every person in any way interested in the company is an American by birth. I was in Washington recently and had to make my statement about the ownership to the officials there at that time, and there seemed to be no belief at that time that the people interested were not Americans."

Mr. Wagner said the only reason that the backers of the new company had sought registry under the American flag was because they did not think it safe to register under any other flag at the present time.

"With England and Germany at war, we couldn't register under either of their flags," he said. "The other countries of war were objectionable for the same reason, and we couldn't register under the Dutch, Danish or Norwegian flags because, while they are not in the war now, they might be drawn in at

any time. That's the only reason we want to register under the American flag."

Mr. Wagner said that the company had bought two ships already and were negotiating for a third. He refused to make known the name of either of the ships already purchased, saying that their names were known in Washington.

The plan of the company was to go into the tramp steamer business, he said. No passengers were to be carried, and the ships owned by the company were to be chartered by owners of cargoes, he explained. At first, Mr. Wagner said that the ships would not be used for trips to the war zones, but later he said they would be chartered to people of any nationality who wanted them. Mr. Wagner said that he and his associates had gone into the business solely because they thought that present shipping conditions throughout the world offered a big opportunity for making money, but said that they expected to devote most of their attention to the South American trade. When asked if he had had any experience with ships, Mr. Wagner said he had, but he declined to say where or when.

Book Reviews

Steam Charts, by F. O. Ellenwood, 86 pages, 7 x 9½, published by John Wiley & Sons, New York, and sold by *The Marine Review* for \$1, net.

This little book is intended to be of assistance to engineers and students when making calculations involving wet or superheated steam. The chief aim of the author has been to prepare a set of steam charts which shall be accurate and comprehensive, and at the same time convenient to handle, and easy to read. An attempt has also been made to give, concisely, the corrections to be applied to the readings of mercury columns, and to prepare a table of velocities, which it is hoped may prove useful.

In order to illustrate some of the uses of the charts and tables, and also to aid those who may desire it, a number of problems, with their solutions, have been added. To make these of more assistance, they have been indexed. For the further aid of those who may desire a brief review of the thermodynamics of steam, and in order to make clear the meaning of all terms used, the few pages covering fundamental principles were written.

For the main chart, total heat and specific heat were chosen as co-ordinates because of the fact that upon these two values could be plotted lines of constant pressure, entropy and quality (or superheat), so that each pair of the five sets of lines will make clear intersections. The total heat entropy chart does not permit this.

To complete the set of values ordinarily needed, the curve was added, showing the heat of the liquid and temperature of vaporization. The supplementary chart, Plate VIII, enables one to read the external work, and therefore obtain easily the intrinsic heat.

The index chart explaining Plates I to VI was made to give a general idea of the relative position and shape of each set of lines, to show quickly the limiting values for each of the six sections, and to assist in determining the particular plate needed.

The range of pressures, qualities and superheats is intended to be more than sufficient for present practice. For

the wet region the inch of mercury was used as the main unit to represent pressures less than one pound absolute, as it is believed that this is the more convenient one for practical work. Special endeavor has been made to prevent confusion of these two units by using broken lines to represent pressures in inches of mercury, and by putting the proper units with each numeral representing pressure in this region.

The Book of the Sextant, With Ancient and Modern Instruments of Navigation, by A. J. Hughes; cloth, 63 5 x 8-inch pages, published by James Brown & Son, Glasgow, Scotland, and sold by *The Marine Review* for \$1.00, net.

At first glance this book would seem to be written for the layman, as it opens with a rudimentary treatise on ancient instruments of navigation. A little further on the reader is confronted by a mass of mathematics with which the author attempts to explain the workings of the various modern instruments. Clarity and system appear to be sadly lacking throughout the book, which, however, contains much information on the sextant and its numerous attachments and modifications. It is interesting to note that most of the illustrations of instruments, which by the way, look as though they had been taken from a catalogue, bear in prominent type a firm name identical with that of the author.

Disinfecting Sewage on Ships

IN LINE with the effort to secure safe water supplies aboard lake steamers and to prevent fouling of municipal sources of supply by discharge of sewage from ships shaping courses close to the intakes, as pointed out in the article on "Water Supply of Ships," by Hugh de Valin, Past Assistant Surgeon, U. S. public health service, in the March, 1914, issue of *The Marine Review*, some progress has been made in the installation of septic tanks aboard passenger vessels. That this practice will become more common may be taken for granted; also sooner or later it will be extended to include freighters.

It will be, therefore, of interest to consider the simplest and most efficient means to the end. The U. S. public health service, in a recent number of *Public Health Reports*, describes an automatic sewage receiving, treating and discharging apparatus designed by Leslie C. Frank of the service. It uses steam as the disinfectant.

"The apparatus consists of a chamber insulated by some heat insulating material, *G*, such as magnesia cement or sawdust; an influent pipe, *B*, penetrating nearly to the bottom of the tank; an effluent pipe, *A*, penetrating nearly to the bottom of the tank, and perforated at some point, *H*, near the top of the tank by a small hole about $\frac{1}{8}$ -inch in diameter; a steam pipe, *F*, provided with an ordinary straightway valve, *E*, and a float, *C*. The lever handle of the straightway valve has been removed and replaced by a disk, at the center of which is freely pivoted the lever arm of the float, *C*, and which disk is provided with two pins, *I* and *J*. The device operates as follows: Assume that the initial water level in the tank is at *K*. The steam

valve, *E*, is in its closed position and the influent pipe, *B*, is submerged below the water level. In other words, the influent pipe, *B*, is always trapped, even at the times of minimum water level in the tank. The entrance of sewage into the tank through *B* causes the level of the water in the tank to rise gradually and to carry the float upward with it. The float arm, however, is pivoted freely upon the steam-valve disc and therefore does not turn on the steam by revolving the disc until it engages the pin *I*; that is, until the liquid in the tank has reached a certain predetermined height, dependent upon the position of the pin *I*. When this height of water is reached the steam is gradually turned on. For a time the entering steam is immediately condensed and gives up its heat to the water.

"The water thus becomes heated at a rate dependent upon the rate and pressure of the steam discharge. As the temperature of the water approaches the boiling point the steam ceases condensing in the water but rises through the water and collects in the chamber space above it. At about the boiling point of water, or a trifle above, the pressure develops in this upper space and gradually forces the sewage up and out through effluent pipe, *A*.

"As the liquid discharges the water level and the float descend, the steam, however, remains turned on full until the float arm engages the pin *J*, when a slight further descent shuts off the steam.

"The level of liquid at which the steam is shut off and at which discharge from the tank immediately ceases may be predetermined by the position of the pin, *J*. The small

hole, *H*, is provided to enable the air in the tank to escape as the sewage enters. The relation of the size of this hole to the total cross-section areas of the steam influent openings is such that only a very small percentage of the steam entering through the pipe, *F*, can escape through the hole, *H*, and therefore pressure develops in the tank practically as fast as if hole *H* were not present. This hole may be replaced by a simple thermovalve, which will be open below, say, 80 degrees Cent., and closed above that temperature, but the percentage of steam escaping through *H* is so low that it is doubtful whether the inclusion of such a valve is warranted.

"Tests conducted with the disinfecter have proved satisfactory from both mechanical and germicidal standpoints. The action of the steam seems to dissolve entirely all solid matter in the chamber, and the germicidal efficiency is practically 100 per cent, the disinfection efficiency is actually 100 per cent.

"The container need not be over 12 to 15 inches high, 12 to 15 inches wide and 4 feet long. Preliminary cost studies indicate that the construction of the disinfecter should not cost much over two dollars per cubic foot capacity, non-installed. The installation cost will vary with the conditions of installation. The capacity of the disinfecter for steamers should be about one hour's flow during the hour of maximum usage.

"The capacity for railway trains may probably reasonably be placed at 3 to 4 hours' flow. It is estimated that the flow from one steamer closet during the maximum hour of usage will not exceed 8 cubic feet. This, with the estimated capacity cost, makes the uninstalled construction cost per closet about

\$16. The two closets on a railway coach will probably not discharge more than 2 cubic feet in the maximum hour, or in 4 hours 8 cubic feet. The uninstalled construction cost per railway coach will therefore probably be from \$15 to \$20."

In most ships it will be found practicable to lead the sewage discharges from closets, etc., to a few such vessels as described above, making them of correspondingly larger size. It will readily be seen that the pressure above the liquid must not be allowed to reach a point where it would displace or disturb the water seal in the traps of the toilets or other drainages. A steam pressure of a pound or two would produce a temperature high enough for germicidal and disinfecting purposes and for discharge overboard if the apparatus is above the water line. Otherwise, a non-return valve may be fitted in the sewage influent pipe to prevent the pressure, which only exists at or about the moment of discharge, from disturbing the trap seals as referred to above.

Although not shown in the accompanying sketch an opening, provided with a suitable steam tight cover, would necessarily be provided for access to the float and valve, though the latter could of course be located entirely outside the tank and operated by an extension of the float lever mechanism.

The apparatus certainly is simplicity itself; it is inexpensive and ought to give good service.

Newport News Busy

Newport News Ship Building & Dry Dock Co., Newport News, Va., has a large amount of construction work under way at the present time. A freight steamship is being built for the New York & Porto Rico Steamship Co., which will be a duplicate of LORENZO, now in the service of this organization. The new steamer will be 347 feet 5 inches in length, with 46-foot 9-inch beam and 25-foot depth. Two colliers are being constructed for the Crowell & Thurlow Steamship Co. They will be duplicates of EDWARD PIERCE and are to be 375 feet in length and 49-foot beam. Two twin screw bulk oil steamers, 14,900 tons dead weight capacity, are being built for the Standard Oil Co., of New Jersey. These boats are 516 feet long and 68-foot beam, with 38-foot depth of hold. A bulk oil steamer 460 x 60 feet, similar to the new steamship JOHN D. ROCKEFELLER, also is being built for the Standard Oil Co., of New Jersey. A 12-knot freight steamship, 425 x 57 feet, is being constructed for Edgar F. Luckenbach. The Mallory Steamship Co. has ordered a combination freight and passenger steamer, 440 feet long and 54-foot 3-inch

beam. The Munson Steamship Line is having a 375 x 49-foot steamship built at the Newport News yards. In addition to the foregoing, the Newport News Ship Building & Dry Dock Co. is building two United States battleships, PENNSYLVANIA and MISSISSIPPI, and two coast guard cutters of 835 tons displacement each.

Canadian Tonnage

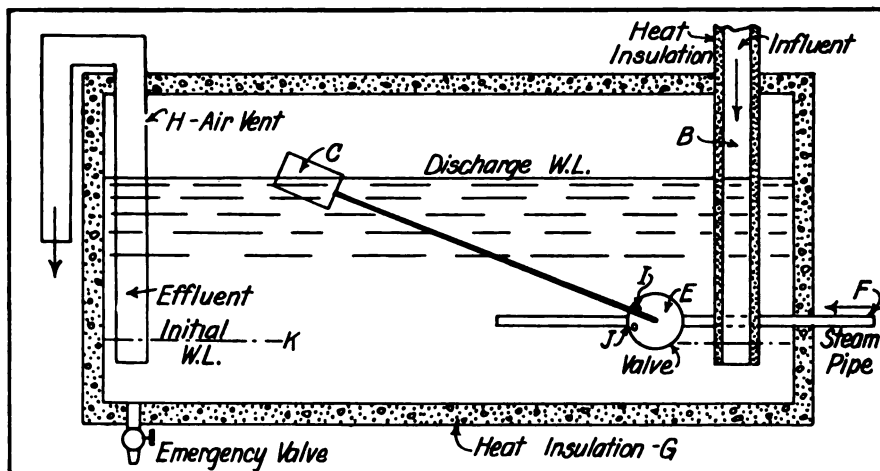
A total of 43,346 gross tons of shipping was built and registered in Canada in 1914, Ontario being credited with 23,167 tons, or more than half. The average displacement of the new craft is about 100 tons. Most of them are fishing schooners, barges and various types of mosquito craft. At the close of 1914, a total of 8,772 vessels, of 932,422 gross tons, was reg-

The losses to the merchant fleet for the past year have not all been reported, but for the first nine months they number 1,062 vessels of 195,052 gross tons.

Launch Big Dredge

CASCADAS, said to be the largest and most powerful dipper dredge in the world, was launched from the New York Shipbuilding Co.'s yard at Camden, N. J., June 26. This dredge is for U. S. government use on the Panama canal, and was designed for exceptionally heavy work, by the Bucyrus Co., South Milwaukee, Wis., which also built the machinery. The construction of the hull and house was sublet to the New York Shipbuilding Co.

CASCADAS is equipped with double tandem compound engines with 16



STEAM SEWAGE DISINFECTING APPARATUS

istered in Canada, representing a value of about \$28,000,000. The year's output of Canadian builders was the largest for 14 years.

American Merchant Marine Grows

Merchant vessels built in the United States and officially numbered by the bureau of navigation, department of commerce, during the fiscal year ended June 30, 1915, were 1,226 of 215,711 gross tons compared with 1,291 of 311,578 gross tons for the fiscal year 1914. During the past ten months, however, under the ship registry act of Aug. 18, 1914, 147 foreign-built vessels of 528,907 gross tons have been added to the American merchant fleet, making the total for the year from both sources 1,373 vessels of 744,618 gross tons.

This tonnage is the largest annual addition to the American merchant fleet in the history of the United States. In 1908 the total increase was 718,683 gross tons, in 1907, it was 596,708 gross tons, and in 1855 it was 586,102 gross tons.

high pressure, 28-inch low pressure cylinders and a stroke of 24 inches. These engines exert a maximum stalling pull on the hoisting rope of 235,000 pounds. The dredge will be completely equipped and tested out at the builder's yard before being dismantled and towed to the isthmus.

Laundries for Battleships

As a result of an experiment on the U. S. battleship TEXAS, crews' laundries will be installed in all new battleships and in the older ones as rapidly as conditions permit. Captain A. W. Grant, until recently in command of the TEXAS, has submitted a report to the secretary stating he found the innovation an excellent one and recommending that it be made universal throughout the battleship fleet. The secretary, approving the recommendation, believes that in addition to effecting economies in the use of fresh water on board ship, a modern laundry will be more sanitary as well as a time-saver.

On the Coasts, Lakes and Rivers

What's Doing and Who's Doing It

Along Puget Sound Shores

By F. K. Haskell

THE commanding officer of the United States coast and geodetic survey wire drag party, searching for obstructions, reports finding a submerged rock with 23 feet of water over it at mean low tide in the entrance of Shakan bay, Sumner strait, Alaska, on the following bearings: Shakan bay light (station L. Lt.), 148 deg. (S. S. E. 7/8 E. Mag.); Spanish island light, 234 deg. (S. W. 3/4 W. Mag.); Beaucaire island light, 305 deg. (N. W. 7/8 Mag.). Geographical position, 56 deg. 10 min. 25 sec. N. latitude, 133 deg. 38 min. 10 sec. W. longitude. This obstruction is on the northerly side of the fairway and is about 1/2-mile south, true, from the 3-fathom spot, and about the same distance west, true from the rocky patch shown on charts Nos. 8, 176 and 8,200. Vessels of large draft at low and minus tides, are advised to give the rocky patch a berth of about three-fourths of a mile.

The United States submarine tender BUSHNELL, under construction at the Seattle Construction & Dry Dock Co.'s plant since June 30, 1913, was recently subjected to her builders' tests, with satisfactory results. In the matter of speed BUSHNELL more than measured up to the government's contract requirements, during four trips over the mile course off Vashon island. BUSHNELL was built at a contract price of \$937,000. She is the largest government contract ever filled at a Puget sound ship building plant, with the exception of the United States battleship NEBRASKA, which was built at the same place, then owned by the Moran company.

Harbor improvements at Anchorage, the new terminus in Alaska, include the dredging of a basin at the mouth of Ship creek 100 feet wide at the bottom and 300 feet wide at the top, which will run from a point opposite the present administration building to deep water in the channel of Knik arm, a distance of about 3,500 feet.

R. M. Semmes, one of the organizers of the newly-formed Independent Steamship Co., which will operate between Seattle, southwestern and southeastern Alaska, has begun his duties as its general manager. He is an old-time Alaskan and was formerly general freight and passenger agent of the Pacific Alaskan Navigation Co. The new company will place the freight and passenger carrier ALLIANCE on the northern route as its first vessel. A larger vessel will later be added to the service.

Damage sustained by vessels in the Oregon district during the year ending June 30, 1915, was more than \$700,000. Only two of the damaged vessels, representing a loss of about \$75,000, belonged in the district. The principal loss sustained for the year included the sinking of the steamer FRANCIS H. LEGGETT, Sept. 18, 1914, off the Oregon coast, resulting

in the loss of 65 persons, and of \$187,000 in the vessel and cargo. A fire aboard the Grace liner SANTA CATALINA, in the Columbia river, Oct. 18, 1914, did \$350,000 damage. The steamer ROCHELLE, owned and inspected in Oregon, piled up on Clatsop spit, Oct. 21, 1914, when entering the Columbia river, and caught fire, being destroyed. Her estimated value was \$64,000. The gasoline schooner RANDOLPH was lost April 24, 1915, on the coast. She was valued at \$8,200. The steamer CLAREMONT, bound from San Francisco, struck and became a total loss at the entrance of Coos bay, May 20. The value of this vessel was placed at \$75,000. The mishap to NORTHERN PACIFIC, June 15, when rudder trouble developed at Flavel, Ore., added \$10,000 additional to moneys expended during the year in repairs. The Oregon district has maintained a record since it was established, of a decidedly small loss of life and property.

The hoisting apparatus for the new Yaquina bay coast guard powerboat, stationed at Newport, Ore., has attracted some unfavorable comment. The boat weighs about ten tons and is worth \$8,000. It is kept in a substantial boat house on Yaquina bay, and is launched by block and tackle. This form of lowering requires nine minutes, sufficient time, it is said, for the destruction of any ship drifting toward a breaking bar, whereas a marine railway would take about two seconds. Government regulations, however, call for a block and tackle hoist and a crib of certain dimensions on which the boat must repose while suspended in the air. The crib at the Yaquina bay station broke last year, smashing the boat's propeller and causing other damage, making the craft useless for several weeks, as well as endangering the lives of the surfmen, who must board the powerboat before it is lowered.

C. H. Williamson, of Wilcox, Peck & Hughes, marine insurance adjusters of San Francisco, will make his headquarters in Seattle for some time to come, in connection with the adjustment of damage claims on the cargo and hull of the steamer MINNESOTA, which went ashore in the Orient during her last voyage.

Rates on bar iron, plates and other unfabricated structural iron materials from New York to Seattle via the Panama canal, have been reduced by the American Hawaiian line from 45 cents to 40 cents a hundred pounds, or \$1 a ton, according to a recent announcement by C. K. Magill, the line's Puget sound agent. Records of the company show that the canal cargo movement between Seattle and New York, both ways, continues to grow at a tremendous rate. Between June 3 and June 28, seven American-Hawaiian liners arrived in Seattle from the Atlantic

metropolis. The regular schedule called for but five.

Officials of the Great Northern Steamship Co. announce the appointment of C. W. Wiley as marine superintendent of the company, succeeding C. C. Lacey, resigned. This follows Mr. Wiley's recent appointment as marine superintendent of the Great Northern Pacific Steamship Co., to succeed Mr. Lacey. His present jurisdiction includes the operation of the big liner MINNESOTA and the new steamers GREAT NORTHERN and NORTHERN PACIFIC, plying between San Francisco and Flavel, at the mouth of the Columbia river. Until early this year, Mr. Wiley was manager of the Pacific Alaska Navigation Co., operating the Admiral lines of steamers in the California and Alaska trade. He will maintain offices both in Seattle and Portland.

Laden with European and Oriental goods for discharge in Seattle, 14 British and Japanese steamers are on their way to the north Pacific. Leading the fleet is the Japanese steamer HUDSON MARU. This vessel is under charter to Frank Waterhouse & Co., Seattle, and will load for Vladivostok, Siberia. She is bringing a cargo of hemp taken on at Manila and gunnies loaded at Hong Kong. The next vessel to arrive will be KAGASHIMA MARU, and shortly after will follow SAIKAI MARU. The Blue Funnel line has three steamers on the way to Seattle, two in the Panama canal service and one in the transatlantic service. The Harrison Direct line has three vessels on the way to Puget Sound, the British steamers CROWN OF SEVILLE, CROWN OF GALICIA, and DISCOVERER. Two British freighters, PROMETHEUS and AMAZON, are heading for Puget Sound ports to load full cargoes of supplies, it is said, for the British admiralty.

Recently announced plans of H. S. Williams & Co., Portland, Ore., for a west coast and a Panama canal line caused much comment. With the Crossett-Western Lumber Co. it has chartered the steamers EUREKA and TAMPICO and will start its Panama canal service with these two vessels. East bound lumber and general west bound freight are the staples of the line.

The West Coast Navigation Co. has chartered a steamer for the beginning of its lumber service to the Atlantic coast. Cargoes for the return voyage will be made up of coal and bulky stuff from the Atlantic seaboard. Two Scandinavian lines, the Olson and Johnson lines of steamers and motor ships, have announced their intention of coming to Portland. European ports open to navigation will be touched by both lines.

The Anderson Shipbuilding Co., Seattle, has launched the steamer BAINBRIDGE, which will be operated by the Eagle Harbor Transporta-

tion Co., between Seattle and Eagle Harbor, Bainbridge island, under the command of Captain C. T. Wyatt.

The steamer COLUSA is the first of the fleet owned by W. R. Grace & Co. to enter the Vladivostok trade. She sailed from San Francisco recently.

The British steamer STRATHESK recently arrived at Jurin, Chile, from San Francisco. When the vessel left the latter port it was understood that she was to proceed to Humboldt bay to load a cargo of redwood for the United Kingdom, being under charter to A. F. Thane & Co., for this purpose, but after a couple of days waiting for STRATHESK to show up at Eureka, Cal., for which port she had cleared, it leaked out that she had been secretly commandeered by the British admiralty and sent down to the west coast.

At a meeting in Seattle, Wash., recently 20 owners of gasoline propelled vessels operated in the towing and jobbing business on Puget Sound, formed the Gas Tug Owners' Association. Captain H. O. Benedict, man-

ager of the N. L. Johnson Towing Co., Seattle, was chosen president of the organization and Andrew Foss of the Foss Launch Co., Tacoma, secretary. One representative from each of the Puget Sound districts were delegated as members of a committee to gather data on rates and service, which will shortly be presented to the public service commission. Between 30 and 40 vessels operating on Puget Sound were represented by their owners at the conference. The public service commission of the State of Washington on May 10, sent out a circular letter to all tugboat men calling attention to the petition filed by the owners of a number of steam tugs asking for the fixing by the commission of rates and regulations. Certain of the owners of gas tugs considered that such action might result in rates and regulations that would drive the gasoline tugboats out of the towing and jobbing business, hence the forming of the new association, which will take care of the interests of the gas users.

The Great Northern Pacific Steamship Co. has inaugurated a tri-weekly steamer service, commencing July 3, between Flavel, on the Columbia river to San Francisco.

nect Lake Pontchartrain and the Mississippi river, running completely across New Orleans. The report is voluminous and covers ten sections, as follows: the commercial and industrial relations of the city and port of New Orleans to the Mississippi valley; New Orleans as an industrial center; rail and water transportation in relation to New Orleans; the present and proposed port facilities of New Orleans and other similar ports; transportation facilities; transportation rates relating to New Orleans, and comparative import and export rates of the Atlantic and gulf ports; New Orleans in relation to trade lines and markets; New Orleans as a potential concentration and distributing port and market of deposit; typical canals of the world; New Orleans ship canal and terminal.

Five routes are proposed for the canal. The first is from a point on the river above Carrollton avenue to a connection with the new basin canal. The second is from the new basin to the river, and the third is from the old basin to the river. The fourth and most important begins at the river below Press street and extends to the lake, while route No. 5 is similar except that it starts from Jackson barracks. The first three are capable of development as barge canals only. The fourth route is available for a barge canal, which can be enlarged into a ship canal.

Plans for the development of this route, or of a fifth alternative route, are also discussed. They include two plans for enlarging part of the canal so as to permit the direct entry of ships, in connection with which is proposed the purchase of tracts of land on each side of the canal to be sold for industrial sites, while a third plan includes such industrial site development in connection with a barge canal. The plans for this route include coal and lumber terminals at the lake end of the canal. The sale of industrial sites is expected not only to replace the money expended for the land, but also to assist in paying the construction cost of the canal.

Jeff D. Hardin has been appointed as a member of the board of port commissioners of New Orleans in place of Walter Van Benthuyssen, recently resigned.

The Yaryan Naval Stores Co.'s two plants located in Brunswick, La., and Gulfport, Miss., were recently sold by order of the federal court. A creditors' committee is reported to be working on reorganization plans.

Mobile's exports by sea for the six months ending with June were valued at \$12,081,867, or more than \$2,000,000 a month. July's cargoes at Mobile were valued at \$1,661,006. Sixty-four vessels, with a net tonnage of 66,451, entered Mobile harbor during June.

MACLOVIO HERRERA, a Mexican gunboat, is believed to have been loaded with arms for the Carranza forces when she slipped out of New Orleans recently. She had previously taken a cargo of ammunition which the authorities forced her to unload. This ammunition was to be loaded on the Wolvin liner CITY OF TAMICO, to be taken to Vera Cruz, but it is said that MACLOVIO HERRERA succeeded in getting it back on board. Included in the cargo were 61,000 rounds of rifle and machine gun ammunition.

The Merchants' Transportation Co. recently organized, is now running the steamer NATCHEZ between Vicksburg and New Orleans. New Orleans merchants and up-country cotton shippers have pledged their co-operation for the success of the service. The Big Bend packet AMERICA has been renovated and will join NATCHEZ in the cotton trade. Steam and

New Orleans and the Gulf

By H. H. Dunn

THE firm of Jose Taya's Sons, Barcelona, Spain, has recently added two large steamers to its fleet plying between Spain and New Orleans, and will add two or three more, it is said, as soon as they can be purchased. Negotiations for the purchase by this firm of two Australian steamers interned in New Orleans harbor are reported under way. This service, best known as the Perez Line, was started some years ago to render the Taya firm independent of the high rates of liner service to Spain and Portugal, especially on forest products. For the past few years it has been conducted with the chartered steamers EMILIA S. DE PEREZ, ANGEL B. PEREZ, INEZ and ADOLFO, carrying lumber from New Orleans, Galveston and other ports on the gulf and south Atlantic seaboard. They also have handled large quantities of cotton, naval stores and other products of the south. EMILIA S. DE PEREZ recently cleared from Tampa, Fla., with 1,000,000 feet of lumber, coming to New Orleans to complete her cargo. So successful have the Tayas been with this business that they have decided to abandon the chartering of vessels and to operate a fleet of their own, which is being augmented as rapidly as suitable steamers can be bought. The first of the new fleet, LOUISA, 1,940 net tons, recently carried a full cargo to Galveston and took out a full cargo on her return. The second steamer, JOSEFA RAICH, recently purchased, and formerly PENA RUBIA, is of 1,629 tons and represents the type of steamers of which the fleet will be composed. She sailed from Barcelona via Seville and thence to New Orleans, returning to Barcelona with lumber. John G. Oriol, president of the firm's interests pany, who is in charge of the firm's interests on this side of the Atlantic, sailed on JOSEFA RAICH and will spend some months abroad seeking to build up his firm's business with United States ports.

The Alabama house of representatives has voted to exempt from taxation all capital invested in new ship building plants, water power plants, cotton mills and establishments for the manufacture of lime or nitrogen, for 10 years. Such exemption of ship building invest-

ments would, it is said, aid materially in the choice of Mobile as a site for the Hyde ship building plant.

Revision of charges on public wharves is being considered by the board of port commissioners of New Orleans. The plan most favored consists of a division of charges between vessels and cargoes, in lieu of the present method, by which all charges for wharfage were levied against the vessel only, on the basis of 2 cents per ton gross register of the ship per day for the first three days at the wharf; 1 cent per day for the next three days, with an extra charge of 1½ cents per ton at shedded wharves, and 30 days free wharfage thereafter. The new plan is first to college wharf rentals at the rate of 3 mills per square foot per month for open wharves and 3½ mills for shedded wharves; also wharfage will be charged against the vessel at the rate of 18 cents per 1,000 ship ton-hours at rented space, 28 cents at unassigned shedded space, and 25 cents at open, unassigned, wharves; a wharfage charge will be laid against cargo, graded according to character; lumber and timber are to be charged for at 25 cents per 1,000 feet; logs and staves at 1 cent per 100 pounds, and piling at ¾-cent per 100 pounds. Conferences will be held with shippers, railroad and steamship interests before the change is put into effect.

River Plate lumber shipments from Pensacola, Fla., during August amounted to about 60 per cent of all the foreign lumber business of that port. For the six months ending with June, Pensacola did an export business by sea of nearly \$1,000,000 per month, despite the lack of shipping, the scarcity of deep-sea vessels, and the general depression attributed to the war. The number of vessels entering and clearing totaled 241, with a tonnage of 413,285, while 32 vessels called for coal. Pensacola's imports for the same time were valued at \$269,589.

Ford, Bacon & Davis, engineers have made a report to the New Orleans board of port commissioners, on the proposed canal to con-

power boat captains plying to the upper coast have reported such a large rice crop that the steamer *MONROE*, Captain G. F. Hollo way, has been put in condition and will go after some of this business.

The government lightship *HEALD*, from Heald Bank, is being repaired at the New Orleans dry dock.

Daniel W. Grace, New Orleans, has been granted a license as chief engineer of lake, bay and sound steamers of 250 gross tons, and as chief engineer of condensing river steamers of any tonnage. William A. Hedding has been granted a license as third-class assistant engineer of ocean steamers, any tonnage. Renewal of license has been granted to Christ Goodyear, New Orleans, engineer of power vessels up to 100 tons, and to Joseph Lynch, New Orleans, as power vessel operator.

The Standard Oil Co.'s big sternwheel tow-boat *C. J. REYNOLDS*, was destroyed by fire at Donaldsonville in August. The crew escaped to three empty barges which the steamer was towing. The cause of the fire has not been learned, nor the amount of loss made public.

The tug *TUNICA* and the U. S. dredge *GULFPORT* have completed work on the Atchafalaya channel, which is now of standard depth and width. The two boats recently

left Morgan City, La., for the Mississippi coast.

Capt. T. T. Parrish, his wife, child and crew, were drowned when his schooner, *DOXA CHRISTINA*, capsized in the Gulf of Mexico two months ago say divers who examined the overturned boat in Tampa harbor, to which she was towed recently.

MONT PELVOUX, first steamer of the new French line to ply between Marseilles, Genoa, Barcelona and New Orleans, has reached the Crescent city, and will return to her home port via Central American ports to pick up cargo.

William Edenborn, president of the Louisiana Railway & Navigation Co., is reported to be preparing to erect wharves, terminals and elevators valued at \$750,000, on the river front of Fairview plantation, St. Charles parish, La., which he recently purchased for \$40,000.

In an effort to draw trade from the railroads, the Chicago, St. Louis & Gulf Transportation Co., which is operating the experimental steamer *STEEL CITY*, has made deep cuts on commodity rates on sugar, coffee and rice out of New Orleans to Chicago and St. Louis.

S. Komuro, director of the Mitsui Bussan

Kaisha, Tokio, Japan, has informed the New Orleans port commission that his company soon will establish a steamer line from Japan through the Panama canal to ports on the Gulf of Mexico.

The Mississippi River Levee Association, through its secretary and manager, is having moving pictures made of work being done on the river to preserve the levees and to keep the stream navigable along 1,000 miles of its course between Cairo and New Orleans. These films will be shown to congress at its next session in an effort to secure federal aid for control and improvement of the great waterway.

Columbus, Miss., and Pickensville, Ala., are now connected by a two-day steamer service, up and down the Tombigbee river. *FRANCES ALLEN*, recently built, is the steamer used to carry freight and passengers through the rich agricultural territory which lies between the two towns. W. J. Yeung is master.

That section of the interoceanic canal which connects the Sabine and Calcasieu rivers, has been completed by the Warren Dredging Co. The canal is 22½ miles long, cost \$125,000, and was commenced in September, 1913. Its completion opens a waterway for the products of the mills and farms of southwest Louisiana to the deep water ports at the mouth of the Sabine river. Regular barge service is being established.

Shippers Active Around Boston Bay

By George S. Hudson

A DIRECT service between Boston and River Plate ports is promised by the Houston Line, which will send its steamship *HELLENES* to Argentina with as heavy shipments from New England as may be offered and, unless necessary, will not call for the customary offerings at New York. That the South American republic seeks more and better service is evidenced by the fact that a Boston firm states a large sum is available to bring about closer commercial relations with this section of the United States. The Boston Chamber of Commerce and other business organizations have interested manufacturers and merchants in the present opportunity and the crusade appears to have borne fruit. *HELLENES*, which is expected to take out large consignments, is a regular steamer of the Houston Line that, heretofore, has depended on New York for the bulk of her outward cargo. The company's ships call at Boston to discharge shipments of hides, wool and quebracho, seldom loading more than a few hundred tons for Buenos Ayres or Montevideo. Up to the present time New England producers have been sending goods to New York either by boat or rail for another handling on the Houston Line piers.

The Ocean Steamship Co., for many years at Lewis wharf, Boston, has leased Pier 42, Hoosac docks, Charlestown, for its terminal and ships are now docking there. Pier 42 has been occupied by the Warren Line and its ships will now berth at Pier 41. The Leyland Line will dock at Piers 43 and 44.

Certain navigation lanes and anchorages in Nantucket and Vineyard sounds may be ordered by the government in an effort to safeguard lives and property in thick weather. Marine associations have been asked for an opinion on the matter and hearings are scheduled in Boston at an early date. Under the Rivers and Harbors Act of March

4, 1915, the Secretary of War is authorized to define and establish anchorage grounds for vessels in all rivers, harbors and bays, and other navigable waters of the United States whenever he deems safe navigation requires such action.

A cargo of 5,000 bales of hemp recently reached Boston in the British steamship *INVERCLYDE*, Capt. Adcock. In addition, the freighter brought a large amount of Japanese general cargo for New York. Coming by way of the canal *INVERCLYDE* called at Honolulu for bunker coal.

Heavy shipments of horses for the allied armies are being made from Boston and Portland, Me., the bulk of this business being handled by the Leyland Line. An average of 2,000 horses are being carried from Boston weekly and the proportion of loss in transit is remarkably small, not more than six or eight animals to a consignment. The horse-carriers have been singularly free from molestation by the enemy's submarines. *ARMENIAN*, formerly in the Boston-Liverpool service, being first of the Leyland liners to be sunk. This immunity from destruction may be accounted for mostly through luck as the ships are not better than 14 knots speed and their course takes them into the Mersey after many hours spent traversing the so-called war zone. Each freighter with horses carries hostlers, frequently as many as 100, many of whom are Americans. Boston is an important loading port for munitions yet representatives of the steamship lines held up their hands when asked relative to the matter. Not long ago the statement that a Cunard chartered ship took a big consignment of war supplies to Liverpool was vigorously denied at the company's office. Nevertheless, ships are departing loaded to Plimsoll and inference is that New England produces the bulk of the goods destined to British ports. Guards patrol the

terminals to prevent, if possible, unauthorized persons gaining admission. Every offering is scrutinized for infernal machines and every person, before being signed as hostler, is obliged to give a satisfactory account of himself.

The log of the British steamship *AEON*, from Sydney, N. S. W., to Boston, covering a period of 42 days, shows that it rained each 24 hours. Capt. Firth regards the almost continual rainfall as remarkable. The ship brought among other items copper, zinc concentrates, ivory nuts, seeds, hair and skins, valued at nearly \$1,750,000. The cargo was discharged at the Lawrence & Wiggin terminal, Boston.

Halibut fishing in the Pacific has not proved profitable for a number of Boston schooners, particularly *VICTOR* & *ETHAN* which has abandoned the business and is now bound home from Seattle by way of the canal. *VICTOR* & *ETHAN* was specially fitted for the venture, sailing from Boston Nov. 8, 1911, for Seattle. She was taken round Cape Horn by Capt. Robert Lathagee, making the passage of about 16,000 miles in a trifle less than 150 days. A 110-horsepower motor weighing about five tons was installed, it being the plan of the vessel's owners to alter her into a power schooner on arrival. Capt. Herbert Nickerson, nominal commander of the schooner, went overland to join her. After a year on the coast with varying success *VICTOR* & *ETHAN*'s masts were cut down and she then depended almost entirely on the motor for propulsion. Indifferent luck may result in other former Boston vessels now engaged in halibut fishing returning to the Atlantic. *VICTOR* & *ETHAN* is being brought to Boston by Capt. J. H. Cass.

Among recent charters is that of the coasting schooner *MAGNUS MANSON* which has

been fixed to load coal at Newport News for Pernambuco at \$7.50 per ton. This is MANSON's second voyage to that port, the schooner having left Newport News last February. She is commanded by Capt. G. W. Torrey.

The five-masted schooner HELEN W. MARTIN will be transferred to Russian registry, the vessel having recently been sold by Percy & Small of Bath, Me., to Russian interests. For 15 years the schooner was employed in the coal trade between Chesapeake Bay and New England ports. Her new hailing port is Archangel. Rumor says that the vessel will load war munitions at New York.

The coast guard cutter OSSISPEE, recently commissioned, will take the place of the cutter WOODBURY along the coast of Maine with headquarters at Portland. WOODBURY has been in active service nearly 50 years and will be sold by the government. The officers and crew have been transferred to OSSISPEE. Probably the last aid rendered by WOODBURY was in the floating of the sloop yacht HUSKIE II from a reef at Cape Porpoise, Me., early last month.

Arrangements for a shipment of refined sugar from Boston to France have been completed though the name of the steamer and date of sailing has not been announced. A shipment of this nature is so unusual as to occasion considerable comment in local shipping circles. The ship will load at the American Sugar Refining Co.'s pier.

Doubt is expressed whether the drillboat ROCKPORT, owned by the Eastern Dredging Co., will be raised from depth of 22 fathoms off Stonington, Me. The craft broke away during a southeaster.

A fleet of steamships has been chartered to load sisal fibre at Yucatan for Plymouth, Mass., and Boston. Recent reports stated that ten vessels were awaiting a loading berth at the Mexican port, only one being accommodated at a time. Much of the fibre will be manufactured into binder twine which is being exported in large quantities.

Boston interests have purchased the lake-built steamer MATOA which is now due at Boston and will be operated in the coastwise coal trade. The ship was dismembered, tugs taking the sections through the Welland Canal. MATOA was built in Cleveland in 1890; she is 290.6 feet long and registers 2,311 gross tons. Another lake-built steamer, LANSING, has been rebuilt at expense of \$50,000 and is engaged in the coal trade in command of Capt. Fletcher, formerly in the steamer J. O. ELLISON. LANSING is now owned by Victor Heath of Boston. She was brought to the coast more than a year ago by C. W. Morse and was laid up at Bath, Me., for a long time.

The tug PETRAL, Capt. Decker, has been secured to tow several lake-built steamers from Montreal to Boston, a distance of about 1,400 miles. PETRAL will replenish bunkers at Louisburg, C. B.

Capt. John Rawding, one of the best-known masters in the merchant service, died July 21, at his home in Melrose, Mass. He began his seafaring career in square-riggers, having been in command of the barks NELLIE SLADE and ROSE INNESS. He then made many voyages in the schooner ELLEN LITTLE. Giving up sailing Capt. Rawding recently accepted the berth of chief officer on the steamer EDWARD

PEIRCE while awaiting command of a steamer. He was stricken at Baltimore but returned home ten days before his death. For 12 years Capt. Rawding had been employed by Crowell & Thurlow of Boston. He was 43 years old and is survived by a wife and one daughter. Three of his four brothers are master mariners.

Rowe Brothers, of Boston, have purchased the steam lighter CORNELIA from New York parties and will operate the vessel in the sand trade between Ipswich, Mass., and Boston. CORNELIA is twin screw and registers 285 gross tons. She will be thoroughly overhauled before entering the new service. Capt. Bener of the steam lighter EUREKA brought CORNELIA from New York.

The naval collier PROTEUS recently arrived at the Boston Navy yard for repairs to her propeller shaft and a cargo of 10,000 tons of coal, loaded at Norfolk for Manila, was discharged to lighten the ship so she might be floated into dry dock.

Owing to dull business the Plant Line has discontinued its service between Hawkesbury and Charlottetown, P. E. I., and the steamer HALIFAX has been laid up. The condition is attributed to hard times resulting from the war. Steamers operating between Boston and

Yarmouth, N. S., are doing a fair business though passenger traffic falls considerably short of expectations. Reports that German submarines might be ordered to this side to prey on British merchantmen is held responsible for many persons abandoning a trip to and from the Provinces.

Experiments with a new wireless system have been conducted on board the steamer HOWARD of the Merchant' & Miners' Line, the inventor's idea being to store current for lighting in addition to a reserve required by the apparatus. Included in the party were F. A. Kloster, of the Bureau of Standards; C. J. Parnell, of the Bureau of Equipment; W. L. Murray, Marconi expert, and H. L. Davidson, an Edison storage battery expert.

That the Cape Cod Canal may be safely navigated by small battleships is the belief of Capt. Ned Evans who recently brought the tug IWANA through the waterway while bound to Boston, from Newport, R. I. The canal has depth of about 25 feet and dredges are at work for still deeper water. Traffic includes yachts and merchant vessels of moderate draft. Tolls were recently reduced. The company has invited the New York Yacht Club's cruising fleet to make use of the canal, gratis, on occasion of the visit to Marblehead this month.

Up and Down the Lakes

By F. A. Churchill Jr.

THE big coal dock owned by James Playfair at Midland, Georgian Bay, Ont., has been put in commission, the steamer GLENSHIE being the first vessel unloaded. The dock is 1,400 feet long and 360 feet deep. Its equipment consists of two bridges, each carrying a 2-ton clamshell.

A new buoy, to be known as East Alpena channel gas buoy No. 1, has been placed at the west side of the outer end of the dredged cut near the docks of the Michigan Alkali Co. and the Huron Portland Cement Co., at Alpena, Mich. The buoy is spar shaped and shows a white light of 120 candlepower, flashing for ten seconds with eclipses of equal duration. The South Graham shoal gas and bell buoy No. 18, in Mackinaw straits, has been changed from occulting to flashing white. The light is of 390 candlepower and flashes for 3/10-second every three seconds.

The steamer GEO. F. BROWNELL, which is to go into service on the Atlantic coast, was recently placed in drydock at Buffalo to be cut in two for the passage of the Welland canal.

The largest cargo of iron ore ever received at Erie, Pa., was recently brought into that port when WM. P. SNYDER JR. arrived with 12,400 tons from Ashland.

A snowstorm in midsummer was the phenomena reported by Captain McLean of the steamer LAKELAND, who says his craft passed through a considerable area of snow and chilling rain on Lake Superior early in August.

A stiff wind which backed up the waters of the Detroit river to a height of 2 feet, enabled several tugs to release the Northern Navigation Co.'s steamer NORONIC, which went aground on Belle Isle recently.

Captain John Knudson, 80 years old and a

lake sailor for 33 years, died recently at his home in Milwaukee.

The steamer ALEXANDRIA, which went ashore near Toronto recently, is a total wreck, her underwriters settling on that basis.

Thomas S. Marriott has been named as Detroit freight agent of the Detroit & Cleveland Navigation Co., succeeding G. G. McIntyre, resigned. Mr. Marriott has been in the company's employ for 28 years. C. A. Miller, until three years ago employed by the company at Cleveland, succeeds him as chief clerk of the Detroit freight office.

Records of the Federal marine postoffice at Detroit show that 2,506 vessels passed through the Detroit river in July.

During July, 9,719,237 tons of freight were locked through the St. Mary's canals at Sault Ste. Marie, Mich. and Ont. This is an increase of 888,981 tons over the tonnage of July, 1914.

The schooner CITY OF SHEBOYGAN, on her way from Erie, Pa., to Toronto, Ont., with coal recently, caused no little worry by her non-appearance at the latter port, but after five days put in at Port Colborne with a tale of hardships endured in a series of gales which caused considerable damage to the vessel.

A book giving sailing directions for Canadian shores of Lake Huron and Georgian bay has just been published. Copies will be supplied to mariners free of charge on application to the hydrographic survey office, department of the naval service, Ottawa, Can.

A chart of St. Joseph channel, Lake Huron, numbered 88, of the Canadian hydrographic survey, has just been published. Copies may be obtained from the hydrographic survey office, department of the naval service, Ottawa, Can.

Around the Golden Gate

By A. A. Willoughby

THE profitable trade which is springing up between San Francisco and South American ports, is creating a lucrative business for the steamship companies which have been developing southern commerce. W. R. Grace & Co. now have eight boats in the South American trade, operating as far south as Talcahuano, below Valparaiso, Chile. These vessels are CUZCO, ST. HELENS, COLUMBIA, WM. CHATHAM, TRICOLOR, AZTEC, EDGAR H. VANCE and GEO. W. FENWICK. CUZCO recently loaded 7,000 tons of Pacific coast products, mainly consisting of flour and rice, for southern ports.

Shipping men are complaining of the present uncertainty of wireless communication with the west coast of Mexico. Ships have in many instances been unable to communicate with Mexican ports for days at a time.

H. N. Thomas, general passenger agent of the Pacific Mail line, has returned from a vacation in southern California.

The coast guard cutter UNALGA, Capt. Harry Hamlet, which has been on patrol duty in the Aleutian islands for the past three months, has been relieved by the cutter MANNING and is now in harbor, probably for a several months' stay.

The Oceanic liner SONOMA, Capt. J. H. Trask, made a record trip to San Francisco from Sydney early last month, making the run in 17 days and six hours, the fastest time recorded via Honolulu. The boat left Sydney two days behind schedule but made up the loss. She brought in a shipment of English gold amounting to \$2,275,000, the largest for many years between Australia and this coast.

The south jetty at the entrance to Humboldt harbor, Eureka, Cal., has been completed by U. S. government engineers after three years' work. To date it has cost \$1,200,000. A similar jetty will be commenced immediately at the north side of the entrance. The Humboldt bar has long been a serious menace to navigation.

The steam schooner FORT BRAGG, for several years a coastwise lumber carrier, has been purchased by the South Sea Navigation Co. and is now in service between San Francisco and Mexican ports.

Dr. C. A. Mackenhenie, surgeon on the Oceanic liner SIERRA for the past two years, and one of the most popular men of his profession on the Pacific, has severed his connection with the company and is going to the front in Europe with an Australian regiment, as surgeon.

The recent visit of the New York nautical school ship NEWPORT to the Golden Gate was of more than passing interest in view of the fact that the state of California plans to establish a school ship of the same type. NEWPORT, with 110 cadets aboard, is making a cruise of nearly 16,000 miles. She is now on her way home, being expected to arrive at New York in October.

The Matson liner ENTERPRISE, Captain Younggren, arrived in port recently from Hilo after one of the stormiest trips she has encountered in years. She ran into a 70-mile gale about 600 miles off-shore, and was at the mercy of the seas for two days.

The old British bark CALCUTTA has made her last run as a trans-Pacific oil carrier for the Standard Oil Co. She was the oldest boat in the company's fleet. She has been sent to England, to be rebuilt into a barge.

The fight between the tugboat interests and one of the large drayage companies for the privilege of handling freight along the San Francisco waterfront, has resolved itself into a question of what constitutes lighterage and drayage. The drayage company holds that transporting freight from dock to dock or from ship to ship when the ships are moored at a pier, constitutes drayage. The tugboat company defines lighterage as invariably the transporting of goods from one place to another by lighter. The local port officials have passed the question up to Washington to answer.

Captain Robert Dollar is delaying action on his company's proposed exit from local shipping circles, in view of the possible repeal of certain provisions in the new seamen's law. MACKINAW and M. S. DOLLAR have already been sold and ROBERT DOLLAR will probably follow. In case the law is not altered, the company, it is said, will remove its headquarters to a British port, probably Vancouver, B. C.

The demand for tonnage between the

Pacific coast and Australian ports has been brisk. Both grain and lumber cargoes are plentiful, and many charters are being taken out for the Antipodean run.

TAISEI MARU, a Japanese merchant marine training ship and one of the few vessels devoted to the training of commercial seamen, spent two weeks at San Francisco last month after an absence of six years. TAISEI MARU is a full rigged sailer with auxiliary steam power.

The American bark ANDREW WELCH, a member of the Matson fleet plying between the Pacific coast and Hawaiian ports, has been sold to Geo. W. McNear of San Francisco. She recently took a cargo for Sweden. Capt. Thomas Peabody, late master of TAM O'SHANTER, has taken command of ANDREW WELCH.

The car ferry SOLANO, of the Southern Pacific railroad, is undergoing a general overhauling in the company's shipyards at West Oakland, Cal. Before CONTRA COSTA was put on the Port Costa-Benicia run, SOLANO had seen ten years' continuous service on this run, with but one 30 day intermission for machinery repairs.

The Panama-Pacific line spends in San Francisco more than \$50,000 for supplies to restock the ship's larder, every time its FINLAND or KROONLAND comes into port. The ships have been handling capacity bookings every trip. KROONLAND, which left San Francisco for New York August 3, took out, in addition to a heavy passenger list, 325 carloads of California products.

On the Delaware River

By Dr. C. S. Street

WHEN secretary of the navy Josephus M. Daniels telephoned the officials of the Philadelphia navy yard his regrets at being unable to attend the recent ceremony of driving the first bolt on TRANSPORT No. 1, he expressed a hope that the Philadelphia yard might build a dreadnaught within two years. Congressman Vares, in a speech at the ceremony, declared navy department officials had informed him that the yard would begin work on a dreadnaught within one year, instead of two.

Work on the first of ten piers to be owned and operated by the city of Philadelphia was recently started and excavating and pile driving is now under way. These piers will extend 1,200 feet into the harbor and will represent a total outlay of \$25,000,000 when completed. The first pier is situated at the foot of McKean street, Delaware river.

The Greek steamer KIKE ISSALIA, which arrived at Philadelphia from Lemni recently with a cargo of magnesite, was stopped three times on the voyage, twice by French torpedo boats and once by a British cruiser.

The steamers PENN and LORD BALTIMORE are now operated by the Ericsson line between the Philadelphia city pier and Baltimore, with stops along the Delaware river and Chesapeake canal. To accommodate the draft of these vessels, the canal is being dredged in several places, much bulkheading also being renewed.

Many changes in the range light system of the upper Delaware river are being made. A

new light known as Chester range has been installed at Essington, below Philadelphia, superseding the old Schooner ledge range.

The Argentine transport PAMPA sailed from Philadelphia recently for Buenos Aires, carrying a large cargo of machinery and equipment for the battleship MORENO, built by the New York Ship Building Co. at its Camden, N. J., plant for the Argentine government. PAMPA also carried small arms, ammunition and coal. MORENO sailed from Philadelphia the first of the year. This is the second cargo of equipment that has been carried to South America for her. The first was carried by the transport CHACO.

A record for the rapid loading of grain at Philadelphia was made recently at the Girard Point elevator, when the steamship PENGREEP was loaded with 249,424 bushels of wheat in bulk and 5,050 ship's bags of wheat, in 12 working hours.

The Maryland Steel Co., Sparrows Point, Md., has contracted for improvements in its marine department, to cost \$1,000,000.

The ferryboat FORT LEE, recently completed at the Harlan & Hollingsworth shipyards, Wilmington, Del., has been towed to Hoboken, N. J., to have her machinery installed at the Fletcher shipyards.

A complaint was recently sent to Washington, D. C., relative to logs and other debris adrift in the Delaware river and bay, which are said to imperil all kinds of vessels. The request was made that a federal vessel be assigned to remove these obstructions.

Red Hot Tips From the Trade

Pertinent Suggestions and Personal Gossip

THE welding and cutting equipment built by the Prest-O-Lite Co., Indianapolis, is illustrated and described in a series of bulletins contained in a loose-leaf binder. One of these bulletins entitled "Fusion or Autogenous Welding" briefly describes the various processes of electric, oxy-hydric, oxy-coal gas and oxy-acetylene welding and cutting, with a chapter on metal-cutting by oxygen. The welding apparatus built by this company is described in an eight-page bulletin and another bulletin of 20 pages points out how the cost of manufacturing may be lowered by repairing broken and worn equipment by oxy-acetylene welding and cutting. This bulletin contains a large number of interesting service views, showing the application of the Prest-O-Lite equipment for welding rolled steel parts, cast iron and for cutting steel. Illustrations of a wide assortment of repairs made by this process are included, which reflect the wide adaptability of this equipment in various classes of work.

Superheaters for Big Tug

The big seagoing tug **WYOMING** of the Lehigh Valley railroad's coal towing fleet is, it is said, the first vessel in the western hemisphere to be equipped with superheaters. They were manufactured and installed by the American Locomotive Superheater Co., New York. These devices heat ordinary saturated steam to the characteristics of a perfect gas.

WYOMING has hitherto burned 20 tons of coal a day, or 6,000 tons a year. If the superheaters do what is promised for them, a saving of from 10 to 25 per cent in fuel consumption will be effected.

Will Build Docks

The St. Louis Railway & Dock Co., which proposes to construct docks and terminals on an extensive scale for the interchange of land and water freight transportation, has been incorporated at St. Louis. The company proposes to build and operate a belt line, 25 miles long, on the river front from the Missouri river and Columbia Bottom road to the vicinity of Van Buren and Catlan streets in South St. Louis. Another corporation will be

formed, according to W. J. Holbrook, one of the incorporators of the St. Louis Railway & Dock Co., to operate a line of barges on the Mississippi river between St. Louis and New Orleans. The incorporators of the St. Louis Railway & Dock Co. are: H. F. Bell, who owns 245 shares; W. J. Holbrook, John Hill, D. Arthur Bowman, John F. Moore and E. W. Banister. The capital stock is \$25,000.

New Type of Diesel

Instead of admitting high pressure air to the working cylinder for starting or reversing, the Southwark-Harris two-cycle Diesel engine, manufactured by the Southwark Foundry & Machine Co., Philadelphia, uses its lower scavenging piston, which forms a unit with the working piston, as a starting engine. This arrangement avoids the admittance of air under high pressure into the hot working cylinders. The larger diameter of the scavenging-starting cylinder, it is said, also permits of the use of lower air pressure for starting. The Southwark-Harris engine has no valves in its working cylinder. It is manufactured for marine use in 12 types ranging from two to eight cylinders and from 120 to 1,600 indicated horsepower. This engine is described in a handsomely illustrated catalog recently issued by the Southwark company.

Detroit Folder

The American Blower Co., Detroit, Mich., is distributing a folder, printed in colors, containing views of a large number of Detroit's prominent manufacturing plants. Interesting statistical information regarding Detroit as an industrial center is also included in the folder.

In a booklet entitled "Graphite Brushes", recently issued by the Joseph Dixon Crucible Co., Jersey City, N. J., an interesting chapter is included, explaining how the characteristic qualities of graphite may be utilized to reduce commutator troubles. Details of Dixon graphite brushes also are given. The Dixon company maintains an electrical service department for the convenience of its customers.

American Ship Catalog

The American Shipbuilding Co., Cleveland, has issued a comprehensive catalog covering its products. The book contains nearly 200 8½ x 12-inch pages. It is bound in loose leaf form so that it may easily be kept up to date. It includes a list of the constituent companies of the American Shipbuilding Co., together with illustrations and descriptive data covering the entire line of products turned out by the company. Illustrations of numerous freight and passenger vessels built by the American Ship Building Co. are presented, together with drawings and illustrations of engines, boilers, deck equipment, cabin equipment, engine room fittings, marine hardware, life boats, electrical fixtures, etc.

Ship Instruments

The Cummings Ship Instrument Works, Boston, has issued an exceedingly attractive catalog describing and illustrating its line of products. Among the ship instruments described are two, three and four shaft averaging counters; course counters; engine room set, stop clock, averaging counter and tell-tale; revolution timer with counter attached; one-way gears; engine log and stop clock; log stand, vacuum cut-off valves, direction indicators and indicator pumps.

A haulage system for warehouses and docks is described in a pamphlet recently published by the Mercury Mfg. Co., Chicago. This system embodies the use of electric power for hauling, the separation of the power unit from the load-carrying body and the placing of all loads upon inexpensive trailer equipment, until final disposition. Each of these divisions is discussed in an interesting manner. A number of photographs are presented showing this system in operation.

The rotary pump manufactured by the Blackmer Rotary Pump Co., Petoskey, Mich., is described in a 16-page catalogue recently issued. A number of illustrations are presented, together with tables and descriptions.

Equipment Used Afloat and Ashore

The Haskell Locator—Diesel Engine for Tug

SHIPS go ashore because the navigator does not know his position and the easier it is for him to find his exact location, the less the chance of accident. To assist the man on the bridge in determining his position accurately, Captain E. Y. Haskell, 31 Bellevue place, New London, Conn., has provided the locator shown in the accompanying illustrations.

It consists of a revolving sight tube mounted on a central standard with a pointer at the lower end. The device is mounted on the binnacle hood. The sight tube is at the height of the eye and is adjustable for height. The pointer revolves just clear of the cover of the compass bowl and is pivoted at its upper end so that it may swing up clear when the vessel is rolling. Pointer and sight tube revolve together, and when the vertical wire in the tube cuts a distant object, its bearing may be read off instantly on the card. The distant object may be terrestrial or celestial, provided its altitude is within the range of the instrument.

In using this device the binnacle hood remains in position the entire time. It is not necessary to remove it to set an azimuth instrument on the glass, nor need the hood be revolved to take a bearing. The locator may be left in place without disturbing anything and it is said that bearings may be taken with ease, day or night. No crouching in an uncomfortable position is necessary, as the sighting device may be adjusted to the exact height of the navigator's eye. The observer is at the steering compass, where he can keep close watch of the course, and not on the end of the bridge, where he must shout to the quartermaster, "Are you on your course?", "How's

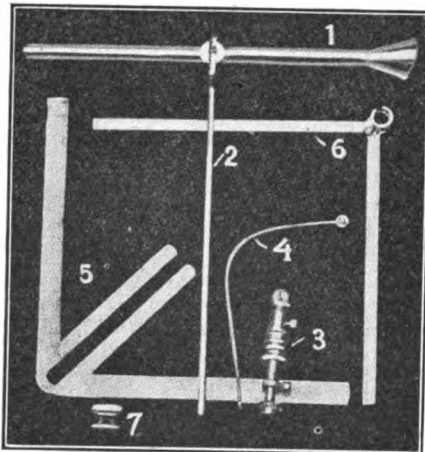


FIG. 2—PARTS OF THE LOCATOR
(1) Sight tube; (2) spindle, or vertical standard; (3) bushing; (4) pointer; (5) sliding, or distance arm; (6) swinging, or marking arm; (7) plug.

her head now?", etc.

When changing courses the pointer may be set in advance to the new course and, after the change is made, it will give a check on the last course steered.

An Example

For example, if steering N E and intending to change to E N E $\frac{1}{2}$ E, $2\frac{1}{2}$ points to the right, set the pointer on N x E $\frac{1}{2}$ E, $2\frac{1}{2}$ points to the left. When her head is E N E $\frac{1}{2}$ E—the new course—pointer will be at N E, the old course.

Bow and beam bearings, two and four-point bearing, etc., may be observed with ease. The pointer is set to the first bearing and the distant object watched until it is cut by the vertical wire. The bearing may then be read and the pointer set for the second bearing. When this is taken the pointer may be left in position and

clamped, if desired, and a check reading made to verify the results found.

An approaching vessel may be watched through the sight tube and it will be noticed immediately whether her bearing changes or not. Risk of collision is thus determined in ample time to take the proper measures to avoid it.

For determining the compass error, amplitudes and time azimuths of the sun, planets or stars may be observed.

Diesel Engine for Tug

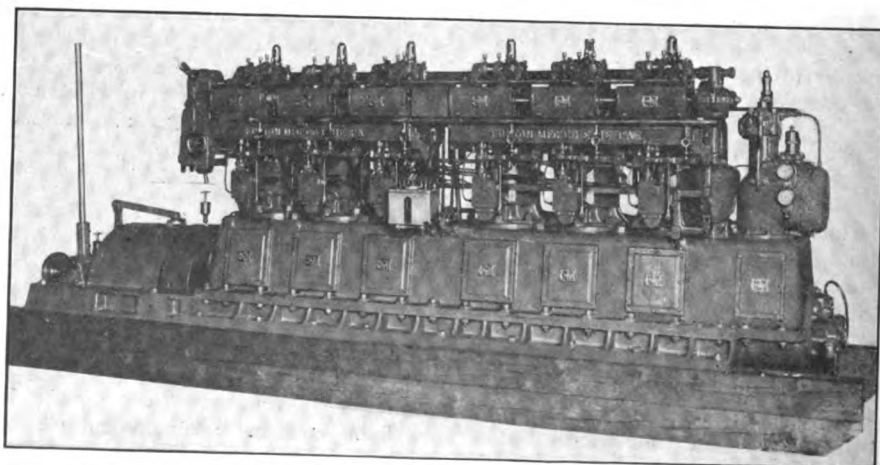
The Fulton Mfg. Co., Erie, Pa., recently shipped a 100-horsepower diesel engine for installation in the tug WILLIE, at Galveston. WILLIE is owned by Captain W. D. Haden. It is stated that the engine is to be operated on low grade California fuel oil which has an asphaltum base of 25 per cent. It has a gravity of 24 degrees Beaume and a heat value of 19,200 B. T. U. The engine is designed for fuel consumption of 0.55 pounds per horsepower-hour.

The accompanying illustration shows the starboard side of the engine, on which are installed the individual fuel pumps for each cylinder. At the extreme right is seen the two-stage air compressor, driven from the main shaft. The primary cylinder compresses the air to from 75 to 90 pounds per square inch. It is then conducted through a cooling coil from which it is delivered to the second stage, where it is boosted to from 800 to 1,100 pounds per square inch.

The diesel type of engine is making rapid gains in the south and west, as desirable power for work boats, several having recently been installed for this purpose.



FIG. 1—USING HASKELL LOCATOR



STARBOARD SIDE OF 100-HORSEPOWER FULTON DIESEL ENGINE